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No Woman, No Cry?

- A study of board members' gender and its impact on company performance

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Preface

By working on this thesis we have tried to achieve a deeper understanding of the current Swedish affirmative action debate. Our intention is to provide an unbiased account of the results obtained from our research to the reader, while furthering academic insights on the topic. Therefore, we have left judgment on the topic to the able reader's discretion.

We would also like to take the opportunity to express our appreciation. Thank you Hossein Asgharian for being our navigator when the path was hard to find. Thank you Petr Tarassiouk for assisting in the time-consuming data collection. Thank you Omeed Rahgozar for finding the English in the Swenglish and time optimizing your input all the way from California. Also, thank you Loren Everly for your feedback.

We hope you find our thesis interesting and wish you a pleasant reading!

Lund, Sweden, May 2010

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Abstract

Title:	No Woman, No Cry[1]? - A study of board members' gender and its impact on company performance
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In recent history, gender diversity has become a frequent subject of discussion in the context of company boardroom and performance. Affirmative action is debated and some countries, like Norway in 2003, have chosen side and taken concrete legal action.

The arguments for and against gender quotas range from qualitative ideological reasoning to more quantifiable statements. However, it seems that too few studies have been conducted in order for a gender quota to be financially justifiable to corporations. Due to this and since the upcoming Swedish election might lead to affirmative actions being introduced in Sweden, this thesis aimed to determine whether board members' gender has an impact on companies' financial performance.

Data from approximately 185 publicly listed Swedish companies over the 2003-2008 period, has been used to investigate whether gender affects the corporate financial performance measures of: revenue, stock returns and return on assets.

By using econometric methods for panel data, it was concluded that no significant relationships could be established between the female ratio and stock returns or revenues. However, a significant negative impact on the return on assets measure was found.

[1] Song by Bob Marley, 1974

Sammanfattning

Titel:	No Woman, No Cry[2]? - A study of board members' gender and its impact on company performance
Seminariedatum:	Den 3 juni 2010
Ämne/kurs:	NEKM01, Examensarbete - magisternivå, 15hp
Författare:	Sophia Bonnevier Dudzik och Oxana Tarassiouk
Handledare:	Hossein Asgharian
Nyckelord:	Bolagsstyrning, kvotering, könsfördelning, lönsamhet, mångfald, paneldata, styrelser

Under de senaste åren har könsfördelningen i bolagsstyrelser blivit en alltmer diskuterad fråga. Positiv särbehandling diskuteras och vissa, som t.ex. Norge 2003, har valt sida och vidtagit konkreta rättsliga åtgärder.

Motiveringarna för och emot kvotering sträcker sig från kvalitativa ideologiska resonemang till mer mätbara argument. Det verkar dock som att inte tillräckligt många studier har utförts för att könskvotering ska kunna vara ekonomiskt försvarbart. På grund av detta samt eftersom det kommande svenska regeringsvalet kan leda till lagstiftade könskvoter, ämnar denna uppsats att försöka fastställa huruvida styrelseledamöters kön har någon inverkan på företagets finansiella prestationer.

Data från cirka 185 svenska bolag, börsnoterade åren 2003-2008, har använts för att se om det finns en koppling mellan kön och de finansiella nyckeltalen: omsättning, aktieavkastning och räntabilitet på totalt kapital.

Med hjälp av resultatet från ekonometriska metoder för paneldata fastställdes det att det finns ett signifikant negativt samband mellan andelen kvinnliga styrelseledamöter och räntabilitet på totalt kapital. Däremot hittades ingen signifikant koppling mellan kön och de två andra nyckeltalen, omsättning och aktieavkastning.

[2] Sång av Bob Marley, 1974

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1. Introduction

This chapter provides background information, states which questions intend to be answered, and shows what areas of focus this study covers.

1.1 Background and problem discussion

A company's performance is measured and determined by numerous factors. When deciding on which company stock to buy, one would like to know that the company is healthy. It is common wisdom to look at market potential, and different financial ratios before investing. However, there are various opinions on what factors have an impact on financial ratios. Recently, gender has been brought into focus as one possible factor in success. There are those who argue that having both genders represented in the boardroom is a must in today's society, and there are those who disagree.

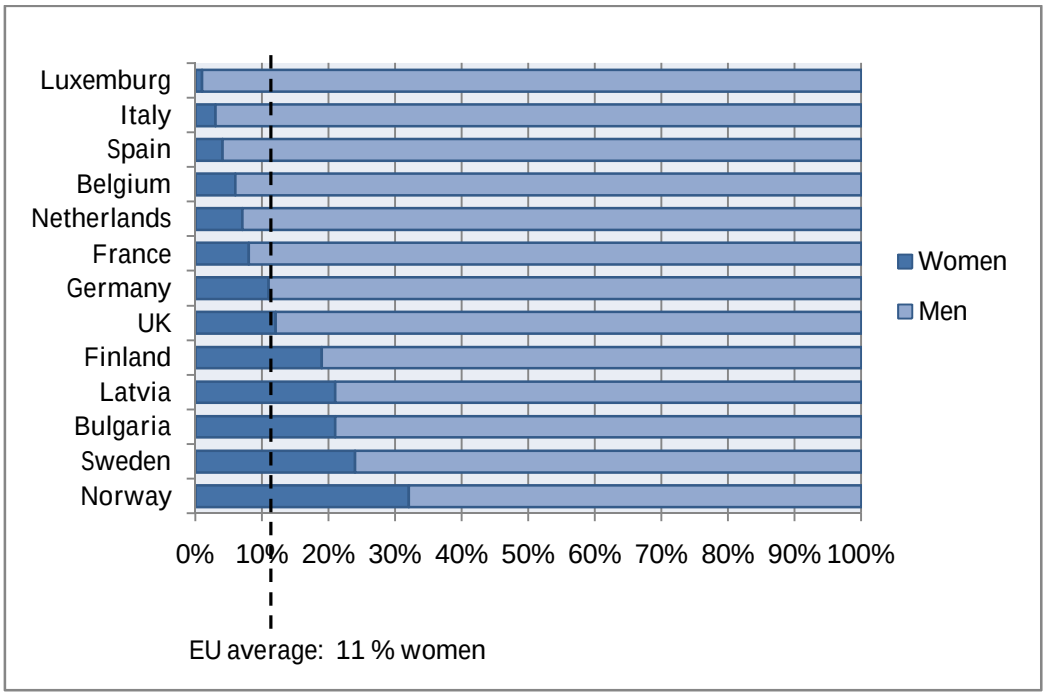
Even though many countries have shown increased interest in corporate gender diversity, few have taken as concrete a step as Norway did in 2003 when it was decided to use affirmative action in order to ensure gender diversity in the boardrooms of publicly listed firms. A lower limit of approximately 40 percent minority representation was set (Lovdata, n.d.). Similar regulations are now being discussed in Sweden. Mona Sahlin, leader of The Swedish Social Democratic Party, says that a gender quota will be set if they win the upcoming election (Samuelsson, 2010). Pro-quota arguments include everything from 'doing the-right-thing'-reasoning to statements about gender diversity's effect on efficiency and conflict levels. On the opposing side, one finds fear over the competence level of affirmative action hires, and intrusion on company rights.

Studies relevant to the topic include for example: *"Women matter: Gender diversity, a corporate performance driver"* report by Desvaux et al. (2007) and the article *"Is there a 'business case' for board diversity?"* by Wang and Clift (2009):

"Women matter [...]", published in October 2007, mapped out the gender management situation in Europe, described what the gender distribution looked like (see Table 1.1),

and also explained how factors like male corporate models and domestic responsibilities affect this spread.

Table 1.1: Gender distribution in the governing bodies of listed European companies year 2006. Statistics on the top 50 companies in each country (Desvaux, et al., 2007, p.5)



Desvaux et al. (2007, pp.1-14) also connected a high level of gender diversity in top management positions to better financial performance when it comes to return on equity, operating results (EBIT) and growth in stock price.

Wang and Clift (2009), at University of Tasmania, narrowed the focus to a general management perspective by only looking at boards. They studied approximately 500 Australian companies in the context of performance and board diversity. With regression analysis, they investigated whether gender and minority diversity had an impact on equity, return on assets and/or shareholder return, and came to the conclusion that gender diversity did not have any significant impact on either of the studied performance measures (Ibid, p.88).

Despite studies like those mentioned above, current political discussions seem to be based mainly on ideological rather than quantifiable arguments, therefore; this thesis aims to contribute to the debate by adding quantifiable analysis and reflections

concerning company performance and gender diversity. However, the analysis will not result in a position in the quota discussions. That is left to the eyes of the beholder.

1.2 Purpose

The purpose of this thesis is to determine whether the gender of board members, females in particular, has an impact on company performance (i.e. return on assets, revenue, and stock returns) by answering the following questions:

- Is there a connection between gender diversity in company boards and company performance?
- Does the women ratio have different impact on company performance depending on factors like industry, age, and geographical location?

1.3 Inclusion/Exclusion criteria

This thesis only looks at companies that are publicly listed and based in Sweden. Only those companies that offer a complete set of required information regarding the years 2003-2008 are included. Also, except for some reasoning in Chapter 2, non-financial performance measures are excluded.

1.4 Outline

Chapter 2 will present the theories that constitute the foundation of the thesis. It will give a detailed insight to what line of reasoning has led to this study of gender diversity and boards, which econometric methods that will be used is also covered.

Next follows Chapter 3 with a description of the methodology, the chosen performance measures, and the data gathering and processing.

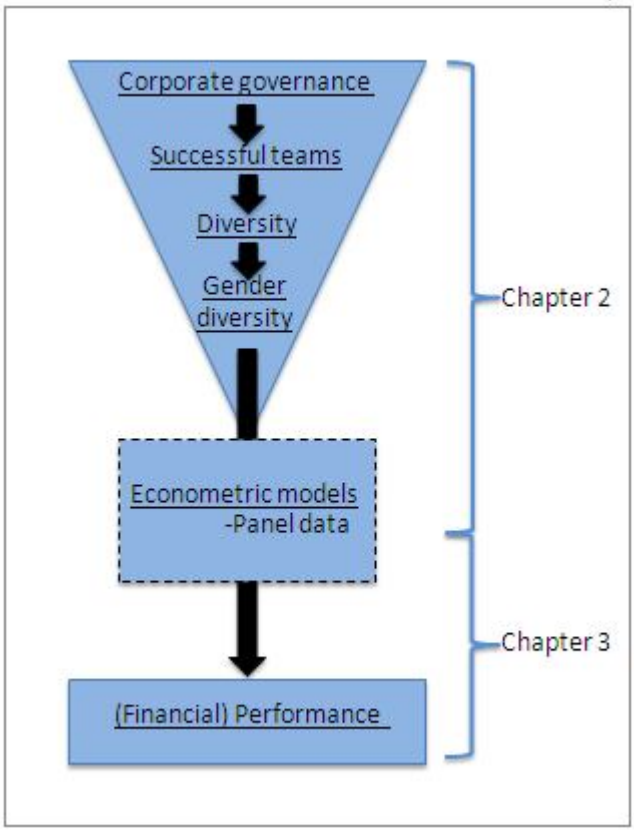
Motivations for data classifications are described in Chapter 4. Descriptive statistics on the current situation in Sweden is also provided.

The results of the analysis are presented in Chapter 5 and Chapter 6 offers a final discussion with suggestions on areas worth further study.

2. Theory

This chapter describes, and Figure 2.1 visualizes, how a wide perspective of an organization is narrowed down to a specific factor that can affect company performance (Section 2.1). Section 2.2 provides a description of the econometric methods that will be used to link a company's gender diversity to its performance.

Figure 2.1: An illustration of the main theories in the thesis and how they are connected



2.1 Qualitative theory

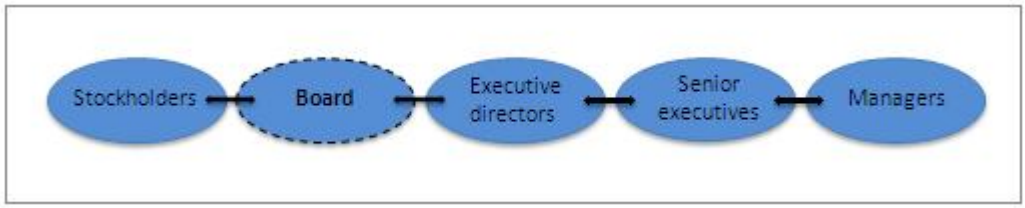
Corporate governance leads to issues concerning successful teams, which results in a focus on gender diversity and its effects.

2.1.1 Corporate governance and the board as a team

Corporate governance is a term that describes how a firm upholds stakeholder interests. It defines the game rules and instructions by which a board of directors must

abide. The framework helps the board to ensure "accountability, fairness, and transparency [...]" (BusinessDictionary, n.d.). Since stakeholders include everything from consumers to stockholders, there is an abundance of interests that must be satisfied in order for the board to achieve its mission, i.e. to maximize shareholder value. Hence, there is a wide range of functions within the firm that must work efficiently in order for the corporate governance system to be successful. The board is one of the units in the corporate governance report/action chain (see Figure 2.2 below) that needs to excel.

Figure 2.2: The corporate governance report/action chain (remake of Johnson et al., 2005, p.166)



A board consists of a group of people, selected for their competence. They add value to the organization by working together as a team (van der Walt et al., 2004, p.6). Hence, one way to define what makes a board flourish is to define critical team success factors.

2.1.2 The successful team and diversity

According to Lind and Skärvad (2009, pp.69-80) there are three criteria that need to be met if the team is going be able to work efficiently; the team members must know what expectations lie upon them, they must have meaningful and motivating assignments, and they must function as an integrated whole. The last one is connected to interpersonal processes and having a well-balanced team. People with diverse qualities balance each other.

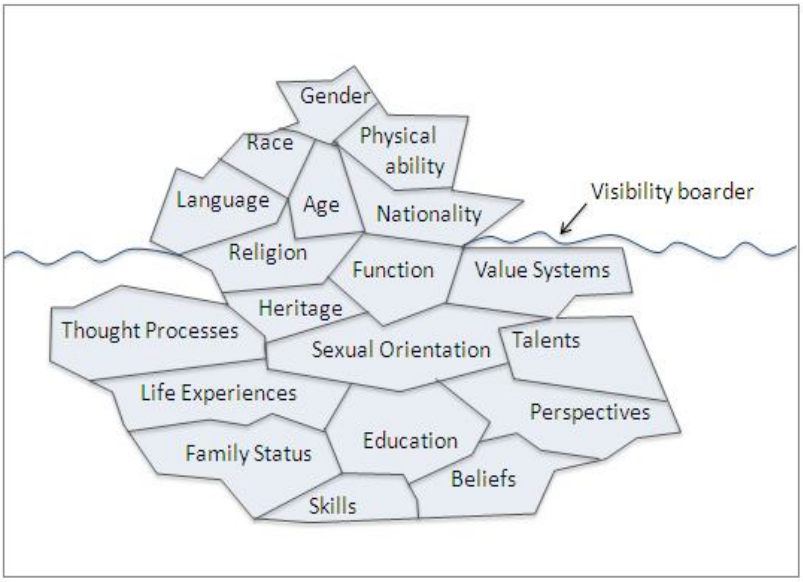
There are numerous of other studies that have identified critical team characteristics. One of those that are aligned with Lind and Skärvad's idea of balance and diversity is Belbin (2002, pp. 89-94) and her six success factors: "

1. The person in the chair
2. The existence of one strong plant in the group
3. A fair spread in mental abilities
4. A spread in personal attributes offering wide team-role coverage
5. A good match between the attributes of members and their responsibilities in the team
6. An adjustment to realization of imbalance"

The six factors include attributes like strong yet patient and cooperative leadership, introvert and extrovert personas, clever and creative mindsets, self-knowledge etc, i.e. a diverse set of features. However, like most things, whether a group gains from diversity depends on the situation. Companies that operate in steady state markets might become less productive as the common ground is thinned out due to an increased diversity level (van der Walt et al., 2004, p.80). The optimal board composition differs depending on factors as industry, geographical location etc. but in general: "[...] boards need to think about whether they have the right composition to provide the diverse perspectives that today's business require [...]" (van der Walt et al., 2004, p.5).

Basically, diversity in a boardroom context refers to the blend of human capital. The right mix can be achieved by combining the different attributes illustrated in Figure 2.3.

Figure 2.3: The Iceberg of Diversity (remake of Gustum, n.d.) – can be used to describe both individuals and teams.

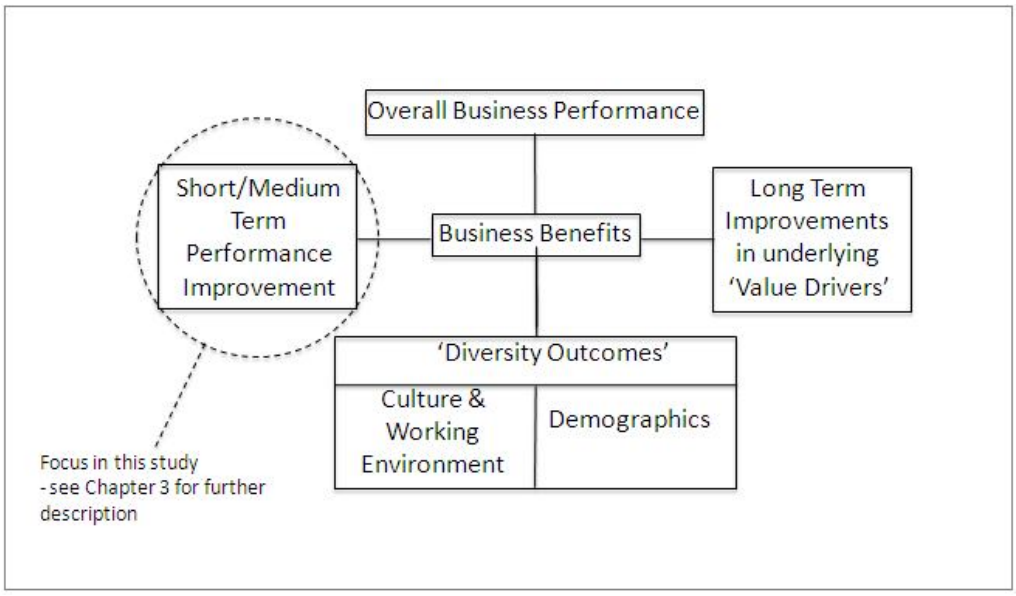


Some attributes are easier to detect than others. Since different properties are linked to each other in various ways, one method to get a variety in some of the not so visible attributes is to focus on obtaining a diverse set of the visible ones, e.g. what nationality you have might for example affect you level of education, religion, value systems etc. Therefore, aiming for gender diversity could be an efficient way for a board to establish the desired mix of human capital.

2.1.2.1 What is to be gained from diversity?

As stated earlier many companies have realized that there is a lot to be gained from diversity (see Figure 2.4). Several of them have developed systems for measuring the costs and benefits. However, "Most of these are qualitative and tend to focus on costs and 'intermediate outcomes', such as workforce attitudes [...] there is little evidence of quantitative assessment [...]" (CSES, 2003, p.4). The qualitative benefits include areas such as improved corporate reputation, enhanced creative and innovative thinking, reduced labor turnover, better attraction rate when searching for new employees etc. (CSES, 2003, p.3).

Figure 2.4: Benefits to be gained from diversity investments (CSES, 2003, p.5)



This study intends to focus on the circled area in the figure above, i.e. focus on how/if the quantitative benefits influence company performance. Searching for a connection between different performance measures and company gender diversity will do this. The performance measures that will be studied are discussed in Chapter 3.

2.2 Quantitative theory – econometric models

This section aims to describe some panel data econometric approaches that are used in order to answer the questions defined in the purpose section.

Since the data in this thesis is a combination of cross-sectional and time dimensions, panel analysis methods should be applied. Section 2.2.1 specifies unobserved components in panel regression models, fixed and random effects models, and specification tests. The second part, 2.2.2, contains a description of pooled regression involving some additional qualitative information.

2.2.1 Panel data models with unobserved effects

The basic linear panel regression model for observations of N individuals over T periods of time and K explanatory variables can be written as

$$y_{it} = \alpha + \beta_1 X_{1it} + \cdots + \beta_K X_{Kit} + u_{it} \qquad \text{(Eq. 2.1)}$$

where y_{it} is the dependent variable, $X_{1it}, \dots, X_{Kit}$ are the explanatory variables, subscript $i = 1, \dots, N$ denotes cross-section or individual, and subscript $t = 1, \dots, T$ stands for time (Matyas & Sevestre, 2008, p.24).

The residual u_{it} in the equation above can be decomposed into three parts, one that accounts for an unobserved individual-specific effect that varies across individuals but is time-invariant, one that represents an unobserved time-specific effect that is constant for all of the individuals but vary over time, and one that contains the remaining errors (Baltagi, 2005, p.33). In equation form it can be expressed as

$$u_{it} = \mu_i + \lambda_t + \nu_{it} \qquad i = 1, \dots, N; t = 1, \dots, T \qquad \text{(Eq. 2.2)}$$

where μ_i is the unobserved individual effect, λ_t is the unobserved time effect and ν_{it} is the error term.

In some panel regression models both μ_i and λ_t should be included. In other models none of the effects are needed; but it is also possible to include only one of the unobserved effects in the regression (Ibid, pp.11,33-34).

Models that contain unobserved effects coefficients can be of fixed or random type (Ibid, p.35). In the fixed effects model the explanatory variables $X_{1it}, \dots, X_{Kit}$ are assumed to be correlated with the unobserved effects. In the random effects model $X_{1it}, \dots, X_{Kit}$ are assumed to be independent of both time, λ_t and individual effect, μ_i.

The final model specification in this thesis contains two steps:

1. Testing what unobserved components should be included in the model. If at least one unobserved effect is significant, continue to the next step. Otherwise run the final model without any unobserved effects. This step will be described in Section 2.2.1.1
2. Examining which model, random effects model or fixed effects model, is more appropriate. The procedure will be discussed in Section 2.2.1.2

2.2.1.1 Fixed effects test

The main idea of fixed effects (FE) tests is a comparison between unrestricted and restricted models (Ibid, pp.34-35). Table 2.1 represents three hypotheses that are tested[3]. All of the unobserved effects in the models in the table below are assumed to be fixed.

[3] Since the number of explanatory variables is of no matter for the specification tests, the models are assumed to have just one explanatory variable.

Table 2.1: Hypotheses of fixed effects tests

Hypothesis of null, H_0	Unrestricted model	Restricted model
$H_0: \mu_1 = \cdots = \mu_{N-1} = 0$ allowing $\lambda_t \neq 0$ for $t = 1, \ldots, (T-1)$	$y_{it} = \alpha + \beta X_{it} + \mu_i + \lambda_t + \nu_{it}$	$y_{it} = \alpha + \beta X_{it} + \lambda_t + \varepsilon_{it}$
$H_0: \lambda_1 = \cdots = \lambda_{T-1} = 0$ allowing $\mu_i \neq 0$ for $i = 1, \ldots, (N-1)$	$y_{it} = \alpha + \beta X_{it} + \mu_i + \lambda_t + \nu_{it}$	$y_{it} = \alpha + \beta X_{it} + \mu_i + \varepsilon_{it}$
$H_0: \mu_1 = \cdots = \mu_{N-1} = 0$ and $\lambda_1 = \cdots = \lambda_{T-1} = 0$	$y_{it} = \alpha + \beta X_{it} + \mu_i + \lambda_t + \nu_{it}$	$y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$
λ_t is the time-specific unobserved effect for time *t*; $t = 1, \ldots, T$ μ_i is the individual-specific unobserved effect for individual *i*; $i = 1, \ldots, N$		

To estimate the significance of the unobserved effects *F*-test was performed. The test is based on the comparison of the residual sums of squares in the unrestricted and the restricted models (Ibid, p.34). In the same order as in Table 2.1, beginning with the test of the individual effect existence, *F*-statistic and corresponding distribution under H_0 are

$$F = \frac{(RRSS - URSS)/(N-1)}{URRS/((N-1)(T-1)-K)} \sim F_{(N-1),(N-1)(T-1)-K} \qquad \text{(Eq. 2.3)}$$

where *RRSS* is the residual sums of squares of the restricted model, *URSS* is the residual sums of squares of the unrestricted model, *N* is the number of individuals, *T* is the number of time period, and *K* is the number of explanatory variables.

For the test of time unobserved effect

$$F = \frac{(RRSS - URSS)/(T-1)}{URRS/((N-1)(T-1)-K)} \sim F_{(T-1),(N-1)(T-1)-K} \qquad \text{(Eq. 2.4)}$$

Note that *F*-distribution numerator degrees of freedom vary with the number of exclusion restrictions in the sets of tests.

Finally, when testing both fixed effects the *F*-statistic is

$$F = \frac{(RRSS - URSS)/(N+T-2)}{URRS/((N-1)(T-1)-K)} \sim F_{(N+T-2),(N-1)(T-1)-K} \quad \text{(Eq. 2.5)}$$

The obtained *F*-statistic can be compared to the tabulated values of *F*-distribution but since the estimation of the data in this thesis were performed in EViews, exact *p*-values were acquired.

2.2.1.2 Random effects test

As previously mentioned, random effects (RE) model requires no correlation between the unobserved effects coefficients and the explanatory variable while fixed effects model assumes that there is such a correlation. To test if X_{it} and unobserved effects are independent, Hausman random effects test is used (Wooldridge, 2006, pp.497-498).

The Hausman test compares FE model estimates with RE model estimates. Under the hypothesis of null both FE and RE models can be used while under the alternative hypothesis only FE estimates are consistent. If the null hypothesis is not rejected, the RE model should be used for the data because it is more efficient (Ibid, pp. 497-498).

2.2.2 Pooled regression with interactions involving dummy variables

One of the purposes of the paper is to determine if the effect of the explanatory variable has a different impact on the dependent variable for different groups, such as gender, country and so forth. The group variable is qualitative and therefore should be coded into a dummy variable, which is equal to 1 if the observation belongs to the group and 0 if it does not. The group variable is also time-constant, which implies that it cannot be combined with any unobserved effects in the same model (Ibid, pp. 486-487). Thus, a model with neither time- nor individual-specific coefficients was estimated, i.e. pooled regression model.

A pooled regression for two groups can be written as

$$y_{it} = \propto + \beta_1 D + \beta_2 X_{it} + \beta_3 D X_{it} + u_{it} \qquad \text{(Eq. 2.6)}$$

where D is the dummy variable (which is assumed to be equal to 1 for group one and 0 for group two), X_{it} is the quantitative explanatory variable, and DX_{it} is the interaction term.

Note that one dummy variable should be excluded from the regression to avoid the case of perfect collinearity (because the sum of the dummy variables is equal to 1) (Ibid, pp.232,240). The excluded group is called the base or reference group.

In Equation 2.6 dummy variable for group two is excluded. The interpretation of the coefficients in the equation is as following: $\propto$ is an intercept for the reference group, β_1 is an estimate of the difference between the intercepts, β_2 is an estimate of the association between the dependent and the independent variable among the reference group, and β_3 is an estimate of the difference between group one and group two's regression lines[4] (Wooldridge, 2006, pp.449-458 and Gåsdal, n.d.).

The principle of the estimation is the same for the case of more than two groups but it is worth mentioning that all the estimated coefficients are related to the base group and there is no information about the significance of the differences between the groups that are included in the equation. If this information is of interest, regressions with different base groups (one at a time) should be estimated.

[4] β_3 is referred to as "difference-in-slopes" coefficient in Chapter 5.

3. Method

This chapter is a review of the thesis' data selection and gathering, practical application of the econometric theory, and some criticism of the sources and methods. From this point "female ratio" or "women ratio" is referred to as WR.

3.1 Women ratio

Since the intention was to focus on the gender effect in Swedish boards, a natural way to select objects to study was to gather those that are publicly listed in Sweden. *"Styrelser och revisorer" ("Board members and auditors")* by Fristedt and Sundqvist (2004, 2005, 2006, 2007, 2008, 2009) contained list of all the listed companies, the total number of board members and also separated by gender. So the first step was to collect the data for all the listed companies during the years 2003-2008.

One of the inclusion criteria is the complete data set for all of the studied years. Before deleting the companies with insufficient data, they were checked for potential name changes in AffärsData's database. By identifying such companies name changes, their information could be completed by linking together their different names. The companies' thereby had a complete set of information and could remain in the data set.

The rest of the firms that lacked information were deleted. Afterward the initial sample included 208 companies.

To obtain the explanatory variable, WR, the number of women on the board was simply divided by the total number of members.

When the original set of companies was finalized, the companies were also categorized into groups according to their age, geographical location and industry. See Chapter 4 for further explanation.

3.2 Performance measures

In order to measure gender's effect on performance, some financial performance measures were required. Most of the necessary financial information was collected from the DataStream database. The last blanks were filled by the information found in the Reuters database.

There is an abundance of ratios and numbers that can be used as measurement. Based on earlier studies and the time at hand, three of those have been chosen for this study: return on assets (ROA), revenue and stock returns.

Revenue is rather self-explanatory and ROA "measures a company's operating efficiency regardless of its financial structure" (Thomson Financial, 2007, p.71). ROA is calculated (Ibid)

$$ROA = \frac{Net\ income + After\ tax\ intereset\ cost}{Average\ total\ assets} \qquad \text{(Eq. 3.1)}$$

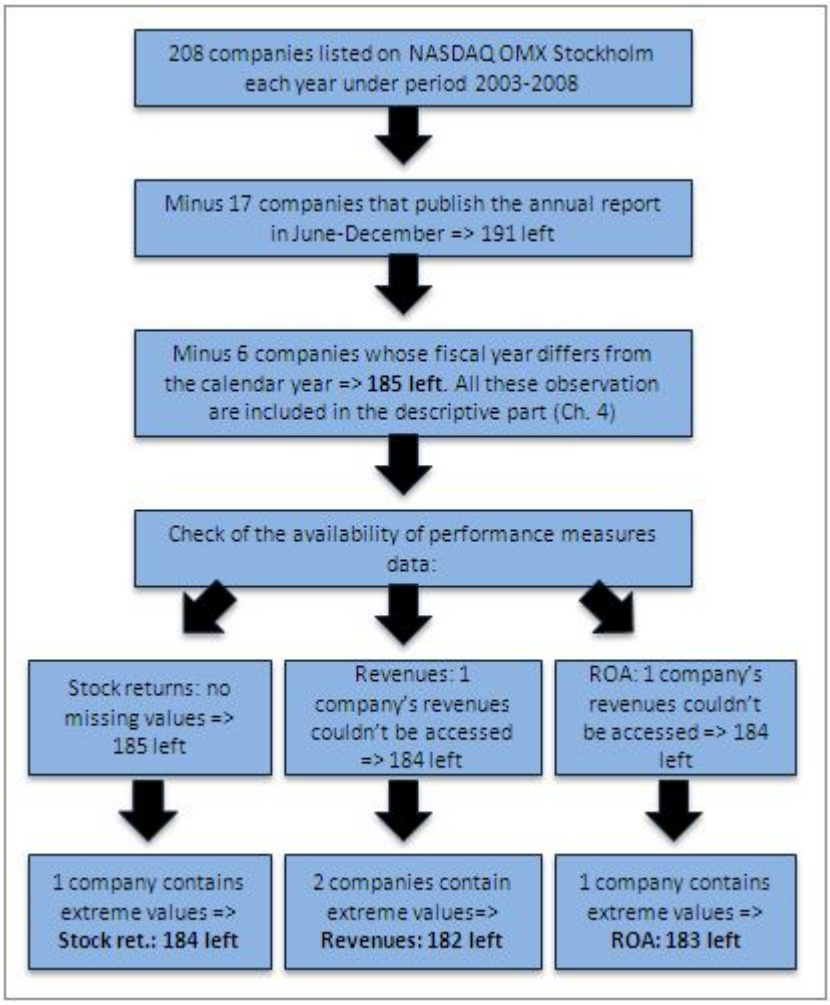
Stock returns were calculated by the following formula:

$$Stock\ return = \frac{Price_{end\ of\ the\ year} - Price_{beginning\ of\ the\ year} + Dividends}{Price_{beginning\ of\ the\ year}} \qquad \text{(Eq. 3.2)}$$

3.3 Narrowing down the data

As stated earlier, the initial set of data contained 208 firms. Then, some observations had to be removed due to various reasons. Figure 3.1 illustrates the process of the final data selection.

Figure 3.1: The data selection process. 208 companies are narrowed down to approximately 180.



"Styrelser och revisorer" is published in the beginning of June every year. Hence, annual reports published after this date will not be presented in the booklet until the following year. This causes a gap between different companies. Since only 17 firms had this 'late' annual reporting, they were excluded from the sample to minimize inaccurate comparison between companies.

Six companies from the remaining sample were excluded due to having a fiscal year that differed from the calendar year. At that point there were 185 companies. The descriptive statistics in Chapter 4 are based on this sample (the list of companies and their classifications are presented in Appendix 1).

The availability of performance measure data was checked. For ROA and revenues, one company's financial information could not be found and was therefore excluded.

Finally, extreme values defined as observations that are more than five standard deviations away from the mean were eliminated.

The data selection was performed in Excel and once the final sample was defined, it was processed with the help of EViews.

3.4 Application of presented econometric models

As described in Chapter 2.2, the econometric method contains two parts: panel regression models with unobserved effects for measuring the overall influence of the diversity in the boards and pooled regression with dummy variables that aims to compare the influence of the WR between different age groups, industries, and geographical locations.

The panel regression models were estimated including one performance measure at a time as the dependent variable and the WR as the explanatory variable. In the revenues case two regressions were estimated: one with percentage changes in the revenues as *y*-variable and another one with absolute values as the dependent variable. The reason for running a regression with absolute values is that, as mentioned in the previous chapter, the unobserved effects models account for differences between individuals regardless of revenue differences.

The pooled regressions were estimated separately for industry, geographical location and age groups. This type of model does not capture the unobserved effects so when estimating the influence on revenue, only percentage changes were taken into account for the model at this time.

In all the nine main pooled regressions (3 performance measures × 3 categories of groups), the excluded group in each of the regressions varied until all the interactions were captured.

It is important to note that unlike the FE/RE models, the pooled regression does not take into account all other factors that might affect the performance measures (e.g. company-specific factors or market trends), the focus will only be on the difference between regression slopes of the compared groups, any other significant findings will not be discussed.

The significance level for all the tests was set to 5 %.

3.5 Criticism

Naturally, the selection and categorization of companies affect the results. For example, by only looking at publicly listed Swedish companies, the spread between industries becomes uneven. Also, the categories help to label and compare companies, but since no firm is identical to the other, a comparison is not entirely accurate.

The equations and methods used to analyze the gender impact is of course, as any other model, a simplification of reality. It does not tell the entire truth. The results may have been more accurate by choosing other performance measures and/or methods to evaluate the relations.

The interpretation, and especially presentation, of the results is a subjective matter. An attempt has been to be as objective as possible but when one has to choose what numbers to present and what they mean, the human factor and personal opinion is inevitable. However, by providing a more extensive report on the results in the appendices, the bias effect is reduced.

Human errors' impact on results and data is not to be underestimated. Any time along the way when a decision has been made, there is risk that the wrong one was chosen, for example, the names of the board members could have been misinterpreted and therefore labeled with the 'wrong' gender. However, having multiple authors has likely eliminated some of this incorrect reasoning, i.e. it takes two to be wrong instead of one in order for the error to enter the thesis.

Also worth scrutinizing are the sources. The aim has been to stay objective in the affirmative action debate. However, it can sometimes be difficult to assess whether a source is objective or not. It is to some extent also difficult not to be influenced by all the media that has been processed during the research stage of the thesis.

Most numbers are collected from the same source, DataStream, which seems to be a reliable source. The financial statistical database should not have any interest in adjusting numbers of the companies and is to be considered as credible source.

Finally, due to time constraints and given purpose, causality assumptions have been made. This thesis assumes that gender affects the performance measures but the reversed relation has not been examined. To getter a better idea of the relationship between gender and performance, both relationships should be studied.

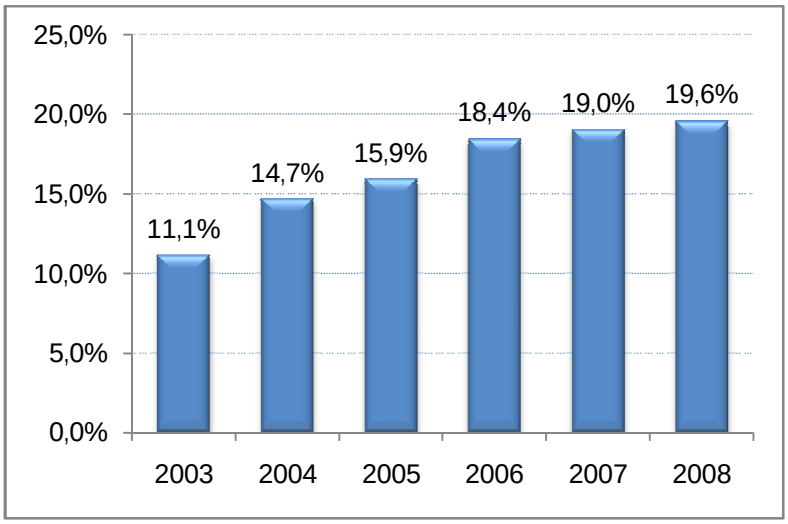
4. Data description and classification

As stated earlier, this thesis studies Swedish listed companies. The following sections present some descriptive data concerning the situation of these companies over the 2003-2008 period. They also describe some firm characteristics worth noting: industry, age and headquarter location.

4.1 Female representation on Swedish boards

Shown below is the development of female representation on Swedish boards during the studied time period.

Table 4.1: Average percentage of women on Swedish boards, year 2003-2008



The table is rather self-explanatory; the WR has increased. However, depending on how the minimum level is set, there is still some ground to be won before the Swedish boards can be called gender diverse.

The following sections in this chapter present a breakdown of the WR in firms according to company industry, age and location.

(It might be added that the WR in 2006 differs from the one in Chapter 1, 18.4 percent versus 20.0. A variation probably caused by factors like this study including 185 firms

versus 50 in the study by Desvaux et al. (2007). Also Table 1.1 refers to top management, which does not necessarily mean only boards.)

4.2 Classifications

As stated earlier, the companies are classified by three different characteristics. The following sections explain this classification.

4.2.1 Industry – some are more dominated by a certain gender

Men and women have different backgrounds, interests, social conditions etc. The difference in background combined with an uneven gender spread when it comes to education (see Appendix 2 for high school education statistics in Sweden) makes it likely that some industries are dominated by a certain gender. It could therefore be considered relevant to note which type of industry the studied company belongs to.

The companies are classified according to the Global Industry Classification Standard, GICS, i.e. grouped into ten different sectors (Standard & Poor's Financial Services LLC, 2008):

- Consumer Discretionary
- Consumer Staples
- Energy
- Financials
- Health Care
- Industrials
- Information Technology
- Materials
- Telecommunication Services
- Utilities

Each sector contains several industry groups and subgroups; a more detail list is to be found in Appendix 3.

Since countries vary in access to different technologies, raw materials, labor etc., industries often gather in clusters. It is therefore to be expected that some sectors will contain more companies than others, which also is the case in Table 4.2 below.

Table 4.2: Company distribution according to sector and the average ratio of women in these sectors' boards, year 2003-2008

Industry	# companies	2003	2004	2005	2006	2007	2008
Consumer Discretionary	20	12%	18%	20%	21%	23%	23%
Consumer Staples	2	17%	31%	38%	36%	41%	46%
Energy	3	0%	0%	4%	8%	6%	7%
Financials	34	13%	15%	16%	17%	17%	18%
Health Care	21	13%	15%	16%	20%	22%	22%
Industrials	52	12%	16%	18%	21%	20%	21%
Information Technology	39	8%	11%	11%	14%	17%	17%
Materials	10	10%	15%	17%	17%	17%	16%
Telecommunication Services	4	9%	10%	10%	26%	14%	13%
Utilities	0	-	-	-	-	-	-

The distribution means that no reliable conclusions can be made about the Utilities, Telecommunications Services, Consumer Staples or Energy sector, the number of observations are too few. Although, the findings concerning those groups can still identify possible correlations and serve as inspiration for further studies and will therefore be included in the study.

Considering earlier discussions regarding gender, the numbers in Table 4.2 are not very surprising. For example, it makes sense that for example the Energy sector has fewer women on their boards compared to the Health Care sector.

4.2.2 Age – the firm's year of registration might affect its gender diversity

To some extent, a company's organization structure, culture, visions etc. reflect the opinions and social structures of its environment. For example, if women are not allowed to work night shifts, then it is less likely to find a high female representation in

an industry where the production is dependent on work that is done during late hours.

Companies adjust to their environment so if society changes, they must change too. However, company structures can sometime be inflexible; it is difficult to change well-established routines and opinions over night. Therefore, the social climate current at the time of a company's founding sets the tone for e.g. the firms' gender diversity. Hence, when grouping companies' year of registry, i.e. by age, it seems reasonable to use certain landmarks in the Swedish history of gender equality as selection criteria.

There are many dates in history that have had an impact on gender equality in Swedish society and thereby also impact gender diversity on company boards. Events such as when women were given the right to achieve a higher level of education in 1870, and when married women achieved legal majority in 1921/1950[5] are of importance (Wahl, 2003, p.57). However, the two years that is used as classification criteria are 1939 and 1988.

As of 1939 employers were no longer allowed to fire a female employee because of marriage, childbirth, etc. (Ibid). This is a rule that is essential when ensuring a high gender diversity in a company, especially in industries/firms where the tolerance levels for absence are low.

The gender equality debate has been going on in various shapes for quite some time. When it comes to affirmative actions resembling those that are discussed today, 1988 is of significance. In 1988, the Swedish government established concrete objectives regarding female representation on their boards and committees (Sandeberg, 2006, p.54).

I.e. the selected companies are divided into three different age groups; those that are founded:

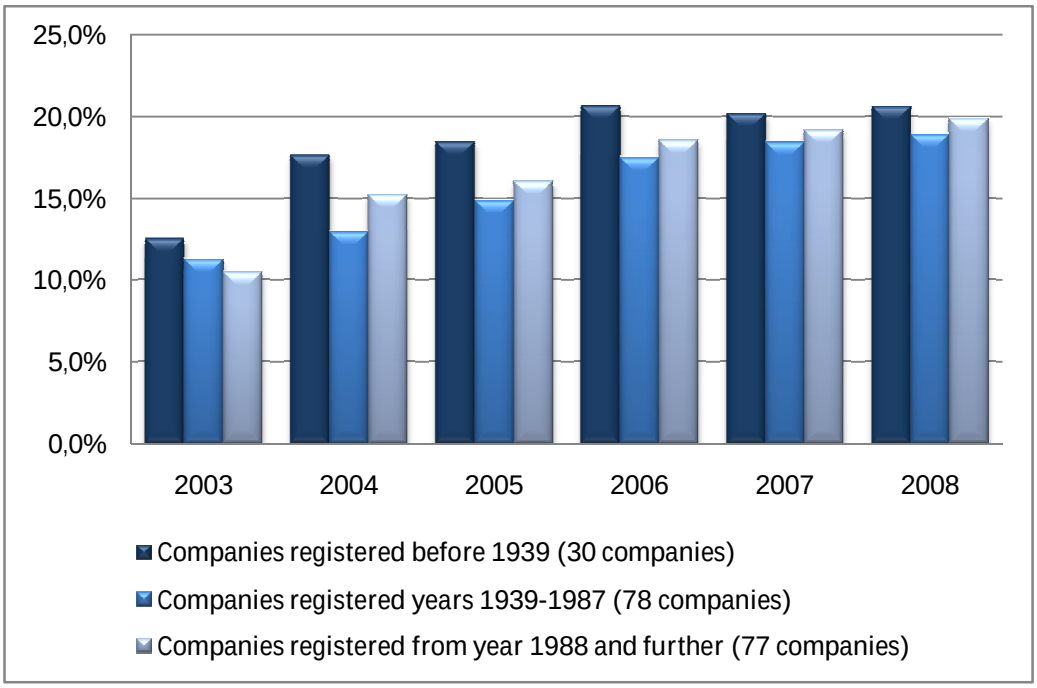
[5] The new law applied only to women married after 1921. Due to transition regulations, it was not until 1950 the law also applied to all married women (Wahl, 2003, p.69)

1) Earlier than 1939

2) Between 1939 and 1987

3) 1988 or later

Table 4.3: Ratio of women on company boards based on the firms' year of registration, year 2003-2008



If the milestones mentioned above have had the expected positive impact on gender equality on the labor market, Table 4.3 shows rather surprising and contradicting statistics. According to the numbers, the oldest companies are consequently those who have the highest representation of women on the board. There could be numerous reasons for this; for example if increasing the number of women is considered to be a risk, older companies might feel that they are so well established that they can afford to gamble; the older companies have faced generational turnover, which could mean that the older companies have a younger, more gender open-minded, management; since the companies are listed, shareholder opinions influence the board composition. Company age and shareholder age are not synonyms.

4.2.3 Headquarter location could influence the representation of women

A company's location affects, among other things, the company culture and its access to qualified employees. Due to factors like salary levels, house and food prices, access to

well functioning public transportation systems and childcare etc., it matters to many job seekers where a potential employer is located. Each gender may reason differently when it comes to the location. Thirty percent of Swedish men and twenty-five percent of women are willing to move to get out of unemployment. Women feel more tied to their home city (Helin, 2009).

As mentioned earlier, Sweden has clusters where human capital and many companies gather (see Appendix 4 for an overview of the educational distribution in Sweden). Hence, as can be seen in Table 4.4 below, the selected companies do not have an even geographical spread. The companies in this study are sorted into two groups:

1) Headquarters based in Stockholm County
2) Headquarters not based in Stockholm County

Table 4.4: Ratio of women on the boards depending on the companies' geographical location, year 2003-2008

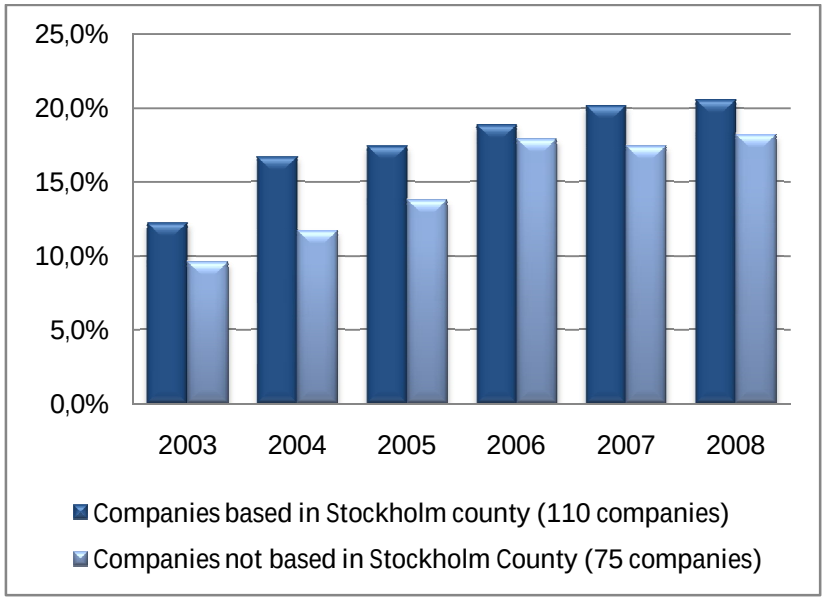


Table 4.4 shows that the firms in Stockholm have a higher average of female representation on their boards.

5. Results and analysis

The results are going to be presented in the same order as the theory in Chapter 2, i.e. first the overall impact of the WR on performance measures and then differences between age groups, industries, and geographical locations.

5.1 General gender impact

General impact refers to the relationship between the performance measures and the Swedish firms as a whole, i.e. before the company classifications enter the equation. The following sections focus on relevant findings, for more extensive results description see Appendix 5.

5.1.1 Stock returns

Table 5.1 shows the results of fixed effects test applied on the regression with stock returns as the dependent variable.

Table 5.1: Fixed effects *F*-test

Effects Test	*p*-value
Individual *F*	0.0748
Time *F*	0.0000
Individual/Time *F*	0.0000

The comparison of the model with both effects and the model without any unobserved effects shows that at least some of the effects are significant. The time-individual effects are strongly significant (*p*-value = 0.000), but the individual-specific unobserved effects seem to be redundant since the *p*-value is higher than 5 %. Possible interpretation of the result might be that there are no large differences between the stock returns of the companies in the sample but the market trend or some other time-dependent effect has an impact on all of the stock returns.

In the next step there are only time-specific effects left and they are tested for independence with the explanatory variable with the help of random effects test.

Table 5.2: Hausman random effects test

Effects Test	*p*-value
Time random	0.0370

The result from Table 5.2 states that the unobservable time effects should be estimated within the fixed effects model because the null of no difference between FE and RE models is rejected to the benefit of the alternative hypothesis that FE model should be applied. Thus, the fixed effects model with only time-specific effects is the final choice (see Table 5.3).

Table 5.3: Fixed effects model with time-specific effects

Variable	Coefficient	*p*-value
WR	-0.2519	0.1040
C	0.2379	0.0000
R-squared	0.2569	
R-squared adjusted	0.2528	

WR's impact on the stock returns is negative but not significant (*p*-value = 10.4 %).

5.1.2 Revenue

As mentioned in Chapter 3, for the revenues two estimations were performed. In the first one the absolute values were used, in the second one a regression with the percentage changes in companies' revenues as the dependent variable was estimated.

5.1.2.1 Absolute values

The results for the *F*-test are:

Table 5.4: Fixed effects *F*-test

Effects Test	*p*-value
Individual *F*	0.0000
Time *F*	0.0000
Individual/Time *F*	0.0000

As can be seen in the table above, the fixed effects test result implies that the both unobserved effects are significant.

The random effects test results are:

Table 5.5: Hausman random effects test

Effects Test	*p*-value
Individual random	error
Time random	0.0000
Individual/Time random	0.0000

According to the Table 5.5 the fixed effects model is appropriate for the time-specific effects. Since the test of the individual-specific effects failed and even the combination of both effects indicates that the FE model should be used, the final model choice is the FE model with both unobserved effects.

Table 5.6: Fixed effects model with time-specific and individual-specific unobserved effects

Variable	Coefficient	*p*-value
WR	-1749881	0.5630
C	13021653	0.0000
R-squared	0.9678	
R-squared adjusted	0.9611	

The coefficient for the WR is negative even for revenues but once again not significant. Worth mentioning is that *R*-squared and *R*-squared adjusted have high values, which means that the model explains 96-97 % of the variation and therefore fits the data well.

5.1.2.2 Percentage changes

The result of the fixed effects test applied on the percentage changes in the revenues (see Table 5.7) implies that both individual-specific and time-specific effects should be included in the model.

Table 5.7: Fixed effects *F*-test

Effects Test	*p*-value
Individual *F*	0.0000
Time *F*	0.0221
Individual/Time *F*	0.0000

The Hausman test in Table 5.8 indicates that both effects can be assumed to be random, i.e. neither firm-specific nor period-specific unobserved effects are dependent of the WR.

Table 5.8: Hausman random effects test

Effects Test	*p*-value
Individual random	0.3159
Time random	0.2469
Individual/Time random	0.5548

The random effects model including both components is

Table 5.9: Random effects model with time-specific and individual-specific unobserved effects

Variable	Coefficient	*p*-value
WR	-0.4771	0.0966
C	0.3394	0.0000
R-squared (weighted)	0.0025	
R-squared adjusted (weighted)	0.0016	

The WR is not significant on the 5 % level[6].

5.1.3 Return on assets

Table 5.10 shows the results of the fixed effects test. The null of no unobserved effects is rejected for all the cases and therefore both the individual-specific and time-specific effects should be included in the model.

Table 5.10: Fixed effects *F*-test

Effects Test	*p*-value
Individual *F*	0.0000
Time *F*	0.0000
Individual/Time *F*	0.0000

[6] Since the *R*-squared values are very low, the fixed effects model was also estimated (see Appendix 5, Revenue). The *R*-squared statistics increased to 25 % (adjusted *R*-squared increased to 9 %) but the female ratio is still insignificant (*p*-value = 53.56 %).

Random effects test (see Table 5.11) indicates that the fixed effects model is more appropriate.

Table 5.11: Hausman random effects test

Effects Test	*p*-value
Individual random	0.0140
Time random	0.0000
Individual/Time random	0.0002

The chosen model results are shown in Table 5.12

Table 5.12: Fixed effects model with time-specific and individual-specific unobserved effects

Variable	Coefficient	*p*-value
WR	-0.2614	0.0002
C	0.0617	0.0000
R-squared	0.5375	
R-squared adjusted	0.4419	

The *R*-squared and adjusted *R*-squared values are 54 % respective 44 %, which means that approximately half of the variation in ROA is explained by the model. This is interpreted as a reasonable result. The WR impact on the companies' ROA is statistically significant (*p*-value = 0.02 %). The effect is negative and means that 1 % increase in the WR leads to 0.26 % decrease in ROA.

The implication of this 0.26 % decrease obviously depends on change in the WR, and change in the WR depends on the current ratio and how many more women enter the board. Table 5.13 below illustrates this by showing the difference in the WR change when one more woman joins a board (by replacing 1 man) consisting of 6 members, due to how many women there were before the change.

Table 5.13: Change of number of women vs. women ratio

# Women before change	Current WR (%)	# Women after change	New WR (%)	ΔWR (%)
1	1/6 ≈ 17 %	2	2/6 ≈ 33 %	100%
2	2/6 ≈ 33 %	3	3/6 = 50 %	50 %
4	4/6 ≈ 67 %	5	5/6 ≈ 83 %	25 %

So, if a woman enters a board with 6 members of which 1 is female, she increases the WR by 100 %. This means a decrease in ROA of 26 % percent. If a woman enters a board where there already are 4 women, she increases the WR by 25 % and the ROA 'only' decreases by 6.5 % (= 25*0.26).

For the 185 companies in the sample, the average number[7] of board members is 6.64 (≈ 7 people) and the average number of women is 1.14 (≈ 1 woman), which implies that for the "average company" a replacement of a man with a woman would mean approximately a 26 % decrease in ROA.

5.2 Comparisons between company categories

The calculations did not result in any significant importance of age or location when it comes to the performance effects of a change in the female board representation. Not on any of the performance measures. The only significant result of combining the categories concern the industry sectors and the performance measure stock return and hence, those results are the only once that will be covered in this section. For information concerning insignificant findings, please see Appendix 6.

The outcome for the industry estimates indicates that which sector the firm operates in could matter for the effect of women on the board. Table 5.14 below shows those combinations of industries that imply significant differences. Since all the significant interactions that were found contain the Energy sector, this sector is the reference group in the table.

Table 5.14: Significant coefficients based on Energy sector as reference group

	Consumer Discretionary	Consumer Staples	Financials	Industrials	Materials
Estimated 'difference-in-slopes' coefficient	4.732	5.161	5.100	4.921	5.247
p-value	4.6%	4.7%	3.0%	3.5%	3.9%

[7] The average is computed for all of the years in the study (2003-2008).

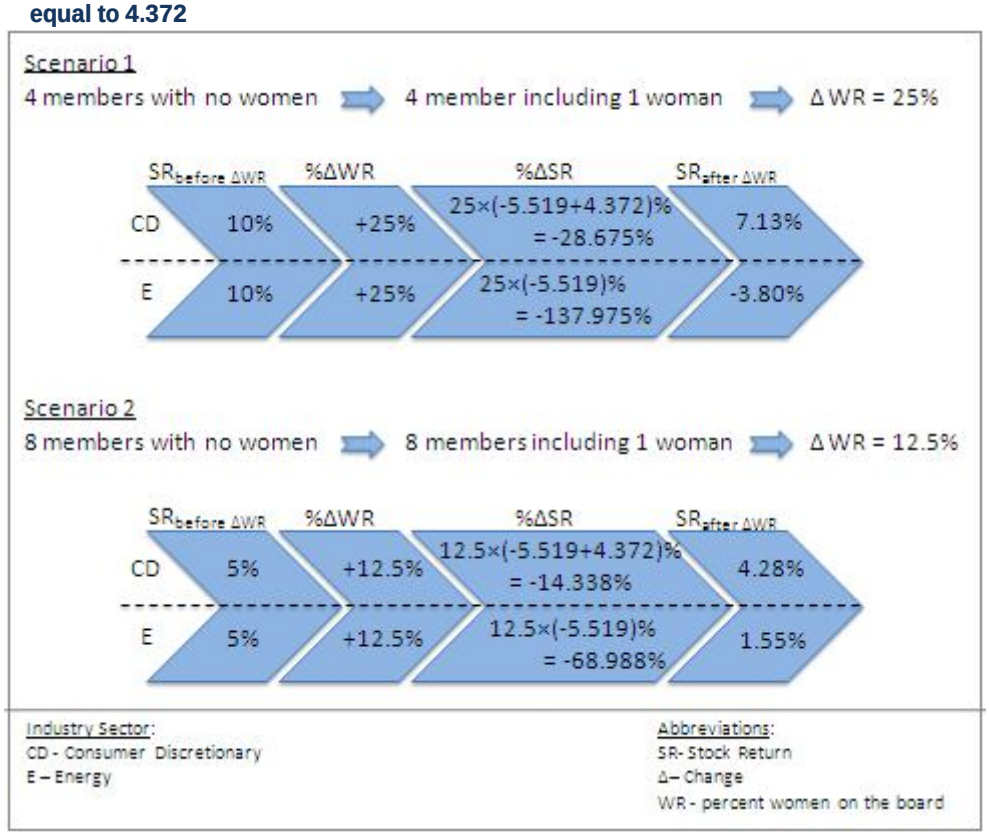
The ‘difference-in-slope’ coefficients and corresponding *p*-values implies that there are significant differences in how the stock returns in the Energy sector responds to a change in the WR compared to the following sectors: Consumer Discretionary, Consumer Staples, Financial, Industrials and Materials.

All the coefficients can be interpreted in the same way, i.e. interpreting one relationship should be enough to explain the meaning of these significance findings. In Figure 5.1 the relationship between the Energy and Consumer Discretionary sectors is used to illustrate what the numbers can mean in practice. The estimated coefficient 4.732 states that the stock return in Consumer Discretionary reacts 4.732 % ‘better’ than Energy does to a one percent increase of WR on the board. The impact of this depends on the current stock return level, how many board members there are and how many of these are women (see the discussion in the previous section, pp.36-37).

Please note that all the values except for 4.732 and -5.519 are fictive and merely included to make the example complete. -5.519 (obtained from Appendix 6) is an estimation of the slope of the regression that describes how the energy sector stock return respond to the WR. So this number is not imaginary but will, due to the reason explained in Chapter 3, not be analyzed.

Scenario 1 and 2 illustrate what could happen with the stock return if a male board member is replaced with a woman in a board with originally 4 or 8 members.

Figure 5.1: Two possible scenarios when the "difference-in-slopes" coefficient is equal to 4.372



If there is a one percent increase in the WR on the board in an Energy sector company, its SR will decrease with 5.519 percent. The "difference-in-slopes" coefficient in Table 5.14 shows that the same change in WR in a Consumer Discretionary, CD, firm will only lead to a -1.147 (= -5.519 + 4.372) percent decrease in its SR (i.e. the company reacts 4.372 % 'better'). What this means for the stock return depends on, as stated earlier, the original stock return and also the difference in percentage effect of a woman entering the board. This is illustrated by the two scenarios (more detailed of Figure 5.1 can be found in Appendix 7):

Scenario 1: When the number of women on the board increase by twenty-five percent, the CD firm goes from 10 % stock return to 7.13 % and the E firm gets a negative return of -3.80 %.

Scenario 2: When the number of women in the board increases with 12.5 % in a company whose stock return is at a level of 5 %, the CD gets a SR of 4.28 % and the Energy firm ends up with a 1.55 % SR.

Hence, the ‘difference-in-slopes’ coefficients are of varying importance depending on the current situation (current WR and SR).

With the meaning of the coefficients being explained, it is important to note that even though the coefficients in Table 5.14 are significant, they are only based on 3 observations (i.e. only three companies in the Energy sector). So the industry groups need further studying before a difference in gender impact can be established with certainty.

6. Final discussion

The main findings are summarized in Section 6.1 and then followed by a discussion on what areas that could be worth further study in 6.2.

6.1 Conclusions

This study set out to answer whether there is a connection between gender diversity and Swedish company performance, and also if WR varies in impact on performance depending on which industry, age or geographical location the firm belongs to.

Of all the calculations that were conducted, only two combinations resulted in significant connections. Return on assets, ROA, combined with the WR in Swedish boardrooms and industry sectors combined with each other and stock returns.

The first relationship says that if the female representation on the board increases by one percent, the firm's return on assets decreases by 0.26 %. Depending on current return and female representation, the implications of this decrease vary. For the 'average company' in this study, the replacement of a man with a woman would mean an approximate 26 % decline in ROA.

Result number two implies that different industry sectors' stock return might respond in different ways to a change in the board's gender distribution. The established relationship says that companies within the Energy sector react 'worse' to a change in the WR, than firms within Consumer Discretionary, Consumer Staples, Financials, Industrials and Materials. However, the test results only show the difference in reaction between industries stock returns, it does not say anything about what the actual change in respective return is. Also important to note is that one should be careful in drawing any conclusion based on these relationships. The Energy sector only constitutes 3 out of 185 studied companies.

So, the most reliable connection that this study has identified is: when a Swedish publicly listed firm increases the level of female representation, it causes a decline in the

company's return on asset. Obviously a much more extensive study on the subject is necessary in order to draw any definite conclusions but the finding raises the question – No Woman, No Cry[8]?

6.2 Further research

Another part of the corporate governance chain that needs to function in order for a company to excel is the executive directors (mentioned in Figure 2.2, p.12). It could be argued that the board of executive directors has a higher impact on the short/medium term performance. Hence, it could be interesting to include the gender diversity on this management level in a female impact study.

As the concluding discussion states, the number of observations in some industries are too few for any reliable conclusions to be made. By broadening the study to for example all European companies, more trustworthy results could be found.

The decisions boards make are often on a long-term strategic basis. Therefore, it could be that decisions taken earlier than the studied time period have influenced the financial results and for the same reason, it could also be that having more women on the board has not had its effect on company performance yet. This could mean that women get the blame for decisions taken by others. In order to minimize these possibly misguiding results, a longer period of time should be studied.

To be able to decide how a company is affected by gender diversity, costs must also be a part of the analysis (a decline in ROA is a cost but cost in this case refers to investments that have been made to ensure diversity).

Non-financial benefits and costs are difficult to measure. Most companies that are considering investing in gender diversity programs would probably appreciate a study that succeeds in linking those factors to measureable gains or losses.

[8] Song by Bob Marley, 1974

As the iceberg of diversity visualized, diversity is so much more than gender diversity. Other ways to ensure a successful mix of human capital should also be analyzed.

This study has not taken company size into consideration. However, it is likely that the size of the firm matters to the importance of gender of diversity.

Finally, “The key to maximizing the potential of a group of people working together is group leadership” (van der Walt, 2004, p.6) it does not matter how well composed a board is when it comes its members, if the board is not led properly. Dissecting the board into smaller components and studying the gender effect on each section and also how these parts interact could be rewarding.

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Databases

AffärsData

Reuters

Thomson Reuters DataStream

Appendices

Appendix 1: List of the companies in the study

Table A1.1: List of encodings

Code	Industry
1	Consumer Discretionary
2	Consumer Staples
3	Energy
4	Financials
5	Health Care
6	Industrials
7	Information Technology
8	Materials
9	Telecommunication Services
10	Utilities
Code	**Year of registry**
1	Before 1938
2	1939-1987
3	After 1987
Code	**Location**
0	Headquarters not based in Stockholm County
1	Headquarters based in Stockholm County

Table A1.2: List of 185 publicly listed Swedish companies over the period 2003-2008 period and their classifications (geographical location, age group, industry)

#	Company	Previous name(s)	Location	Age group	Industry sector
1	AcadeMedia		1	2	1
2	Acando	AcandoFrontec AB	1	2	7
3	Active Biotech		0	2	5
4	AddNode	Adera	1	2	7
5	Affärsstrategerna		1	3	4
6	Alfa Laval		0	3	6
7	Anoto Group		1	3	7
8	Artimplant		0	3	5
9	Aspiro		0	3	7
10	Assa Abloy		1	2	6
11	Atlas Copco		1	1	6
12	AudioDev		0	2	7
13	Avanza Bank Holding	Avanza AB	1	2	4
14	Axfood		1	3	2
15	Axis		0	2	7
16	Beijer Alma		0	2	6
17	Beijer Electronics		0	1	7
18	Bergs Timber	CF Berg	0	2	8
19	Betsson	Cherryföretagen	1	2	1
20	Bilia		0	2	1
21	Billerud		1	1	8
22	BioGaia		1	3	5
23	BioInvent International		0	3	5
24	Biolin Scientific	Biolin	0	2	5
25	BioPhausia		1	3	5
26	Biotage	Pyrosequencing	0	3	5

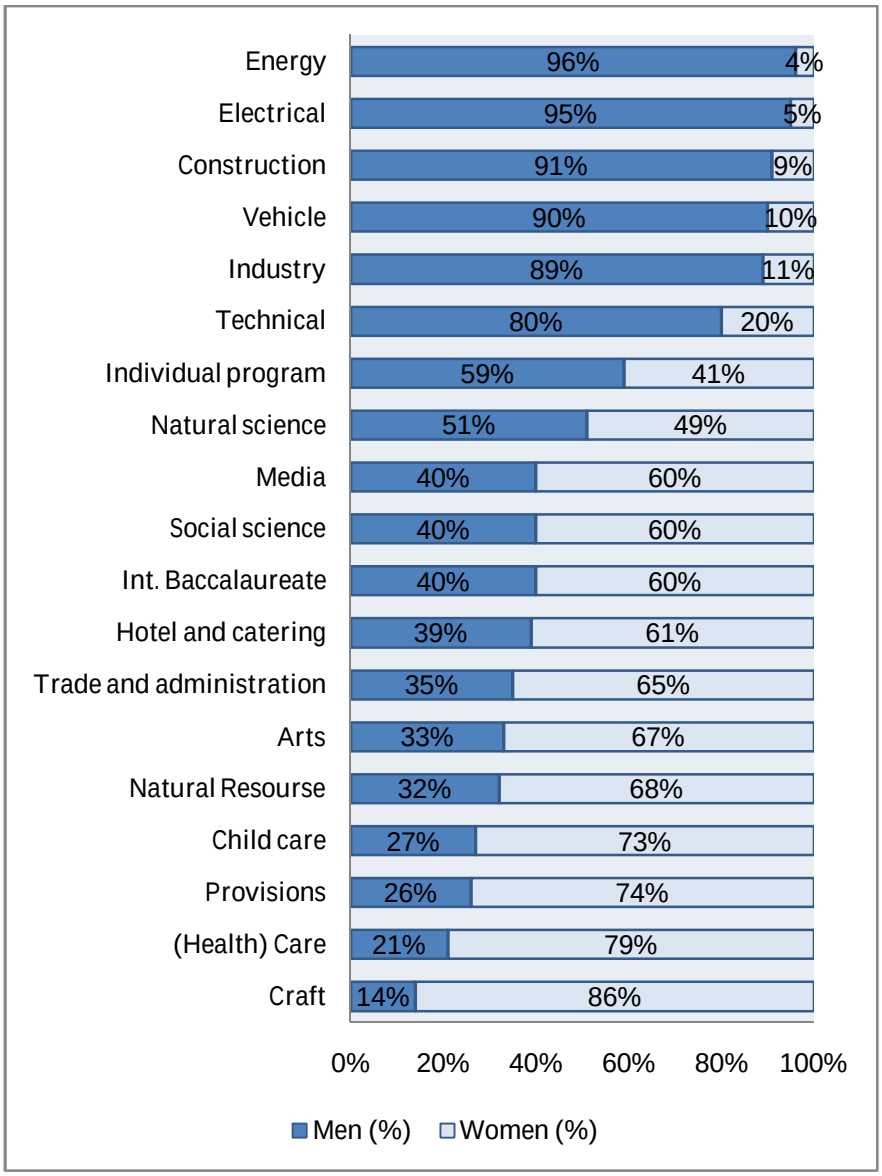
#	Company	Previous name(s)	Location	Age group	Industry sector
27	Boliden		1	2	8
28	Bong Ljungdahl		0	1	6
29	Borås Wäfveri		0	2	1
30	Brio		0	2	1
31	BTS Group		1	3	6
32	Bure Equity		1	3	4
33	Castellum		0	3	4
34	Cision	Observer	1	1	6
35	Concordia Maritime		0	2	3
36	Confidence International	Confidence	1	2	7
37	Consilium		1	3	6
38	Corem Property Group	Biolight International	1	3	4
39	Countermine		1	3	6
40	Cybercom Group Europé	Cyber Com Europé	1	3	7
41	Dagon	Sign On, Wise Group	0	3	4
42	Digital Vision		1	3	7
43	Doro		0	2	7
44	Duroc		1	3	6
45	Elanders		0	1	1
46	Electrolux		1	1	1
47	ElektronikGruppen BK		1	2	7
48	Elos	Westergyllen	0	1	5
49	Enea	Enea Data	1	2	7
50	Eniro		1	3	1
51	Ericsson		1	2	7
52	Fabege	Wihlborgs	1	2	4
53	Fagerhult		0	2	6
54	Fast Partner		1	2	4
55	Feelgood		1	3	5
56	Fenix Outdoor		0	2	1
57	Fingerprint Cards		0	2	7
58	G & L Beijer		0	2	6
59	Getinge		0	3	5
60	Geveko		0	1	6
61	Glycorex Transplantation		0	3	5
62	Gunnebo		0	3	6
63	Haldex		1	1	6
64	Havsfrun		1	2	4
65	Heba		1	2	4
66	Hebi Health Care		1	2	5
67	Hennes & Mauritz		1	2	1
68	Hexagon		1	2	6
69	HiQ International		1	3	7
70	HL Display		1	2	6
71	Holmen		1	1	8
72	HQ	Hagströmer & Qviberg	1	3	4
73	Hufvudstaden		1	1	4
74	Höganäs		0	1	8
75	IFS		0	2	7
76	Industrivärden		1	2	4
77	Intoi	Nocom	1	3	7
78	Intrum Justitia		1	2	6
79	Investor		1	1	4
80	Jeeves		1	3	7
81	JM		1	2	1
82	Kabe		0	2	1
83	Karo Bio		1	3	5
84	Kinnevik		1	2	4
85	Klövern		0	3	4
86	Know IT		1	3	7
87	Kungsleden		1	3	4
88	Lammhults Design Group	Expanda	0	3	6

#	Company	Previous name(s)	Location	Age group	Industry sector
89	Latour		0	1	4
90	LBI International	Framfab	1	3	7
91	Ledstiernan		1	2	4
92	LifeAssays		0	3	5
93	Lundbergs		1	2	4
94	Lundin Petroleum		1	3	3
95	Malmbergs Elektriska		0	3	6
96	Meda		1	3	5
97	Medivir		1	2	5
98	Megacon		1	2	6
99	Mekonomen		1	3	1
100	Micro Systemation		1	2	9
101	Micronic Laser Systems		1	3	7
102	Midway Holding		0	3	6
103	Modul 1		1	3	7
104	MSC		1	2	7
105	MTG		1	2	1
106	MultiQ International		0	3	7
107	Munters		1	2	6
108	NCC		1	1	6
109	NeoNet		1	3	4
110	Net Insight		1	3	7
111	New Wave Group		0	3	1
112	Nexus		1	3	7
113	NGS Group	NGS	1	3	4
114	Nibe Industrier		0	3	6
115	Nilörngruppen		0	3	1
116	Nobia		1	3	1
117	Nolato		0	2	7
118	Nordea Bank		1	3	4
119	Nordnet		1	2	4
120	NovaCast Technologies	NovaCast	0	2	6
121	Novestra		1	3	4
122	Novotek		0	2	7
123	Obducat		0	3	6
124	OEM International		0	2	6
125	Opcon		1	2	6
126	Orc Software		1	2	7
127	Ortivus		1	2	5
128	PA Resources		1	3	3
129	PartnerTech		0	2	7
130	Peab		0	2	6
131	Phonera	Viking Telecom	0	3	9
132	Poolia		1	3	6
133	Precise Biometrics		0	3	7
134	Prevas		0	2	7
135	Pricer		1	3	7
136	Proact IT Group		1	3	7
137	Probi		0	3	5
138	Proffice		1	2	6
139	ProfilGruppen		0	2	8
140	Q-Med		0	2	5
141	Ratos		1	1	4
142	RaySearch Laboratories	Taurus Petroleum	1	3	5
143	ReadSoft		0	3	7
144	Rederi AB Transatlantic	B&N Nordsjöfrakt	0	2	6
145	Retail and Brands		1	3	1
146	Rottneros		0	1	8
147	Rörvik Timber		0	3	8
148	Saab		0	1	6
149	Sandvik		0	1	6
150	SAS		1	3	6

#	Company	Previous name(s)	Location	Age group	Industry sector
151	SCA		1	1	8
152	Scania		1	2	6
153	SEB		1	3	4
154	Seco Tools		0	2	6
155	Securitas		1	2	6
156	Semcon		0	3	6
157	Sensys Traffic		0	2	7
158	SHB		1	1	4
159	Sigma		0	3	7
160	SinterCast		1	2	6
161	Skanditek		1	2	4
162	Skanska		1	1	6
163	SKF		0	1	6
164	Softronic		1	2	7
165	SSAB		1	1	8
166	Studsvik		0	3	6
167	Sweco		1	3	6
168	Swedbank	FöreningsSparbanken	1	2	4
169	Svedbergs		0	2	6
170	Swedish Match		1	1	2
171	SäkI		1	1	4
172	Tele2		1	3	9
173	TeliaSonera		1	2	9
174	Ticket Travel Group		1	3	1
175	Traction		1	1	4
176	Trelleborg		0	1	6
177	Tricorona	Tricorona Mineral	1	3	6
178	Wallenstam		0	2	4
179	VBG Group	VBG	0	2	6
180	Venue Retail Group	Wedins Skor & Accessoarer, Nordic Shoes & Accessories	1	3	1
181	Vitrolife		0	3	5
182	Volvo		0	1	6
183	XANO Industri	ITAB	0	2	6
184	ÅF	Ångpanneföreningen	1	2	6
185	Öresund		1	2	4

Appendix 2: Gender distribution in Swedish high schools

Table A2.1: Swedish high school students sorted by gender and education program 2009/2010 (Skolverket, 2010)



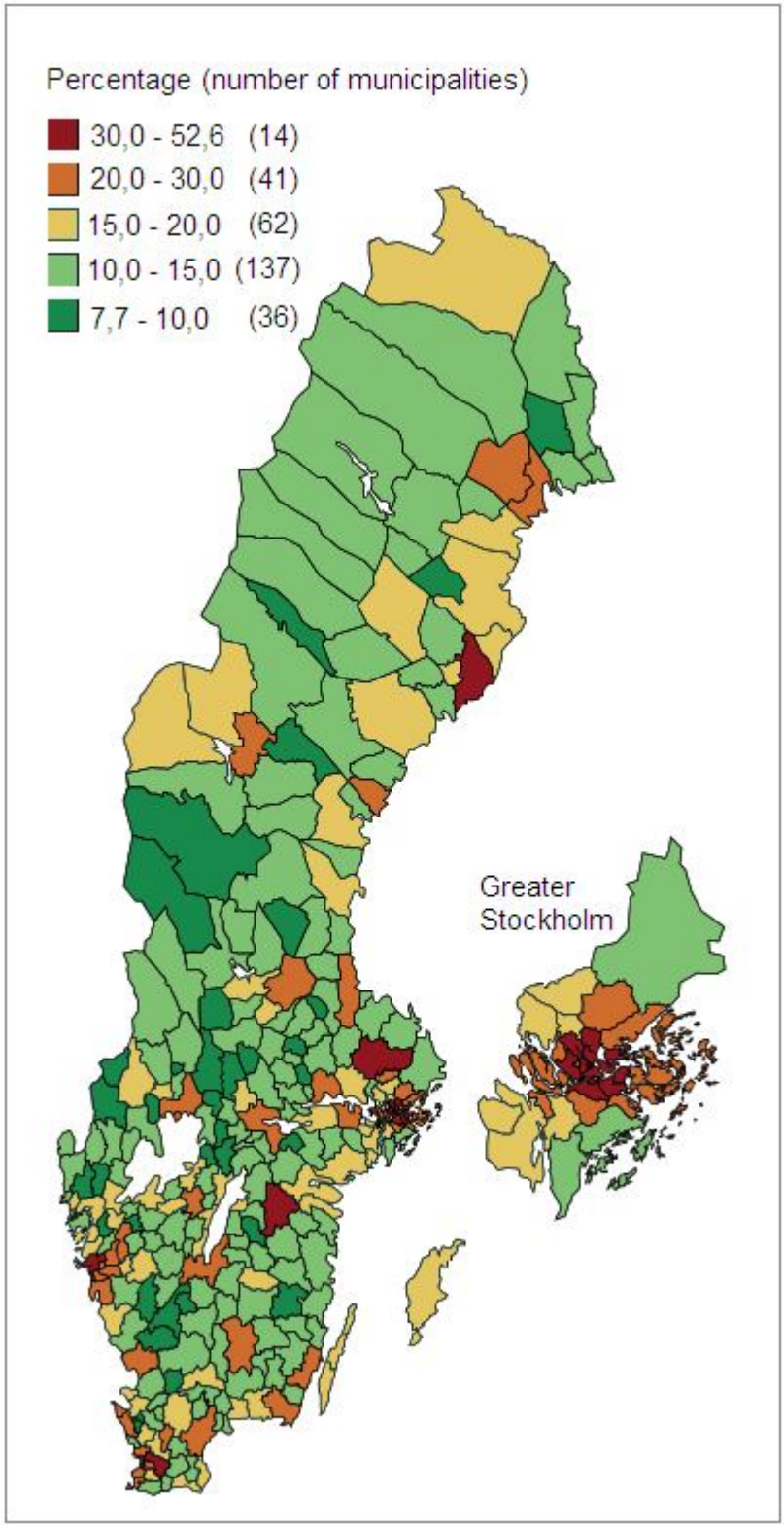
Appendix 3: Industry sectors and their subgroups

Table A3.1: 10 industry sectors and their subgroups (Standard & Poor's Financial Services LLC, 2008)

Sector	Industry Group
Consumer Discretionary	Automobiles & Components
	Consumer Durables & Apparel
	Consumer Services
	Media
	Retailing
Consumer Staples	Food & Staples Retailing
	Household & Personal Products
	Food, Beverage & Tobacco
Financials	Banks
	Diversified Financials
	Insurance
	Real Estate
Industrials	Capital Goods
	Commercial & Professional Services
	Transportation
Health Care	Health Care Equipment & Services
	Pharmaceuticals, Biotechnology & Life Sciences
Telecommunication Services	Telecommunication Services
Materials	Materials
Information Technology	Software & Services
	Technology Hardware & Equipment
	Semiconductors & Semiconductor Equipment
Energy	Energy
Utilities	Utilities

Appendix 4: Swedish education statistics 2008

Figure A4.1: Percentage of the Swedish population, at the age 25-64, with a post-high school education of minimum 3 years, year 2008 (SCB, 2010, p.498).



Appendix 5: Results for the general gender impact

Stock returns

Redundant Fixed Effects Test
Dependent Variable: Stock returns
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.172770	(183,914)	0.0748
Period F	68.755568	(5,914)	0.0000
Cross-Section/Period F	3.070186	(188,914)	0.0000

Correlated Random Effects - Hausman Test
Dependent Variable: Stock returns
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	4.350770	1	0.0370

Dependent Variable: Stock returns
Method: Panel Least Squares
Sample: 2003 2008
Periods included: 6
Cross-sections included: 184
Total panel (balanced) observations: 1104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WR	-0.251879	0.154797	-1.627158	0.1040
C	0.237932	0.031036	7.666203	0.0000

Effects Specification

Period fixed (dummy variables)

R-squared	0.256874	Adjusted R-squared	0.252809

Revenue

Absolute values

Redundant Fixed Effects Tests
Dependent Variable: Revenues
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	145.577421	(181,904)	0.0000
Period F	15.681946	(5,904)	0.0000
Cross-Section/Period F	141.741997	(186,904)	0.0000

Correlated Random Effects - Hausman Test
Dependent Variable: Revenues
Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	1	1.0000
Period random	38.588514	1	0.0000
Cross-section and period random	45.847267	1	0.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

Dependent Variable: Revenues
Method: Panel Least Squares
Sample: 2003 2008
Periods included: 6
Cross-sections included: 182
Total panel (balanced) observations: 1092

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WR	-1749881.	3024153.	-0.578635	0.5630
C	13021653	534173.6	24.37719	0.0000

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.967789	Adjusted R-squared	0.961126

Percentage changes

Redundant Fixed Effects Tests
Dependent Variable: Percentage changes in revenues
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.565765	(181,904)	0.0000
Period F	2.642919	(5,904)	0.0221
Cross-Section/Period F	1.602451	(186,904)	0.0000

Correlated Random Effects - Hausman Test
Dependent Variable: Percentage changes in revenues
Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.005947	1	0.3159
Period random	1.340646	1	0.2469
Cross-section and period random	0.348718	1	0.5548

Dependent Variable: Percentage changes in revenues
Method: Panel EGLS (Two-way random effects)
Sample: 2003 2008
Periods included: 6
Cross-sections included: 182
Total panel (balanced) observations: 1092
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WR	-0.477138	0.286932	-1.662898	0.0966
C	0.339350	0.070462	4.816073	0.0000

Effects Specification	S.D.	Rho
Cross-section random	0.293594	0.0861
Period random	0.092857	0.0086
Idiosyncratic random	0.952171	0.9053

Weighted Statistics			
R-squared	0.002530	Adjusted R-squared	0.001615

Unweighted Statistics	
R-squared	0.002940

This table is just a test if the *R*-squared values could be improved by trying to estimate the fixed effects model even if FE/RE test implies that random effects model is more appropriate.

Dependent Variable: Percentage changes in revenues
Method: Panel Least Squares
Sample: 2003 2008
Periods included: 6
Cross-sections included: 182
Total panel (balanced) observations: 1092

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WR	-0.275999	0.445360	-0.619722	0.5356
C	0.306291	0.078666	3.893540	0.0001

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.250169	Adjusted R-squared	0.095060

ROA

Redundant Fixed Effects Tests
Dependent Variable: ROA
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.471465	(182,909)	0.0000
Period F	14.779528	(5,909)	0.0000
Cross-Section/Period F	5.636647	(187,909)	0.0000

Correlated Random Effects - Hausman Test
Dependent Variable: ROA
Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.036881	1	0.0140
Period random	24.045610	1	0.0000
Cross-section and period random	14.317491	1	0.0002

Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2003 2008
Periods included: 6
Cross-sections included: 183
Total panel (balanced) observations: 1098

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WR	-0.261351	0.070803	-3.691262	0.0002
C	0.061708	0.012504	4.935007	0.0000

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.537506	Adjusted R-squared	0.441853

Appendix 6: Results for the comparisons between company categories

Stock returns

Age group		Age1	Age1*WR	Age2	Age2*WR	Age3	Age3*WR
Reference group	Constant						
Age1	0.265	x	-0.798	0.058	0.188	0.076	-0.069
p-value	(0.013)	x	(0.120)	(0.623)	(0.746)	(0.523)	(0.903)
Age2	0.323	-0.058	-0.188	x	-0.611	0.017	-0.257
p-value	(0.000)	(0.623)	(0.746)	x	(0.023)	(0.813)	(0.484)
Age3	0.341	-0.076	0.069	-0.017	0.257	x	-0.868
p-value	(0.000)	(0.523)	(0.903)	(0.813)	(0.484)	x	(0.001)

List of the variables:
WR = women ratio
Age1 = Companies registered before year 1939
Age2 = Companies registered years 1939-1987
Age3 = Companies registered from year 1988 and further

Notes:

a. AgeX*WR is the interaction term between the companies within age group X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (stock returns) and x-variable (women ratio) among companies in the reference group, and the corresponding *p*-values.
c. Note that the shaded areas are mirrored with the opposite sign.
d. Significant (p-value < 5 %) differences between regression slopes are in bold.

Geographical location		Loc1	Loc1*WR	Loc2	Loc2*WR
Reference group	Constant				
Loc1	0.370	x	-0.847	-0.093	0.073
p-value	(0.000)	x	(0.000)	(0.183)	(0.837)
Loc2	0.277	0.093	-0.073	x	-0.773
p-value	(0.000)	(0.183)	(0.837)	x	(0.006)

List of the variables:
WR = women ratio
Loc1 = Based in Stockholm county
Loc2 = Not based in Stockholm county

Notes:

a. LocX*WR is the interaction term between the companies within location group X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (stock returns) and x-variable (women ratio) among companies in the reference group, and the corresponding *p*-values.
c. Note that the shaded areas are mirrored with the opposite sign.
d. Significant (p-value < 5 %) differences between regression slopes are in bold.

Industry		Ind1	Ind1*WR	Ind2	Ind2*WR	Ind3	Ind3*WR	Ind4	Ind4*WR	Ind5	Ind5*WR	Ind6	Ind6*WR	Ind7	Ind7*WR	Ind8	Ind8*WR	Ind9	Ind9*WR
Reference industry	Constant																		
Ind1	0.408	x	-0.787	-0.178	0.429	0.507	**-4.732**	-0.170	0.368	0.022	-0.522	-0.104	0.189	-0.109	-0.152	-0.252	0.515	0.037	-0.665
p-value	(0.001)	x	(0.132)	(0.702)	(0.738)	(0.020)	**(0.046)**	(0.241)	(0.586)	(0.900)	(0.502)	(0.452)	(0.760)	(0.420)	(0.814)	(0.247)	(0.659)	(0.871)	(0.553)
Ind2	0.230	0.178	-0.429	x	-0.359	0.685	**-5.161**	0.008	-0.061	0.200	-0.951	0.074	-0.240	0.068	-0.580	-0.074	0.086	0.215	-1.094
p-value	(0.608)	(0.702)	(0.738)	x	(0.759)	(0.158)	**(0.047)**	(0.986)	(0.961)	(0.669)	(0.466)	(0.871)	(0.844)	(0.880)	(0.637)	(0.878)	(0.956)	(0.660)	(0.475)
Ind3	0.915	-0.507	**4.732**	-0.685	**5.161**	x	-5.519	-0.677	**5.100**	-0.485	4.209	-0.611	**4.921**	-0.616	4.580	-0.759	**5.247**	-0.470	4.067
p-value	(0.000)	(0.020)	**(0.046)**	(0.158)	**(0.047)**	x	(0.017)	(0.001)	**(0.030)**	(0.029)	(0.077)	(0.002)	**(0.035)**	(0.002)	(0.051)	(0.003)	**(0.039)**	(0.077)	(0.106)
Ind4	0.238	0.170	-0.368	-0.008	0.061	0.677	**-5.100**	x	-0.419	0.192	-0.891	0.066	-0.179	0.061	-0.520	-0.082	0.147	0.207	-1.034
p-value	(0.004)	(0.241)	(0.586)	(0.986)	(0.961)	(0.001)	**(0.030)**	x	(0.328)	(0.200)	(0.215)	(0.544)	(0.741)	(0.566)	(0.362)	(0.682)	(0.896)	(0.322)	(0.338)
Ind5	0.430	-0.022	0.522	-0.200	0.951	0.485	-4.209	-0.192	0.891	x	-1.310	-0.126	0.711	-0.131	0.371	-0.274	1.037	0.015	-0.143
p-value	(0.001)	(0.900)	(0.502)	(0.669)	(0.466)	(0.029)	(0.077)	(0.200)	(0.215)	x	(0.023)	(0.380)	(0.285)	(0.352)	(0.590)	(0.215)	(0.384)	(0.948)	(0.901)
Ind6	0.304	0.104	-0.189	-0.074	0.240	0.611	**-4.921**	-0.066	0.179	0.126	-0.711	x	-0.598	-0.006	-0.341	-0.148	0.326	0.141	-0.854
p-value	(0.000)	(0.452)	(0.760)	(0.871)	(0.844)	(0.002)	**(0.035)**	(0.544)	(0.741)	(0.380)	(0.285)	x	(0.071)	(0.954)	(0.497)	(0.449)	(0.766)	(0.491)	(0.414)
Ind7	0.299	0.109	0.152	-0.068	0.580	0.616	-4.580	-0.061	0.520	0.131	-0.371	0.006	0.341	x	-0.939	-0.143	0.667	0.146	-0.514
p-value	(0.000)	(0.420)	(0.814)	(0.880)	(0.637)	(0.002)	(0.051)	(0.566)	(0.362)	(0.352)	(0.590)	(0.954)	(0.497)	x	(0.013)	(0.462)	(0.547)	(0.471)	(0.628)
Ind8	0.156	0.252	-0.515	0.074	-0.086	0.759	**-5.247**	0.082	-0.147	0.274	-1.037	0.148	-0.326	0.143	-0.667	x	-0.272	0.289	-1.180
p-value	(0.392)	(0.247)	(0.659)	(0.878)	(0.956)	(0.003)	**(0.039)**	(0.682)	(0.896)	(0.215)	(0.384)	(0.449)	(0.766)	(0.462)	(0.547)	x	(0.794)	(0.275)	(0.412)
Ind9	0.445	-0.037	0.665	-0.215	1.094	0.470	-4.067	-0.207	1.034	-0.015	0.143	-0.141	0.854	-0.146	0.514	-0.289	1.180	x	-1.453
p-value	(0.021)	(0.871)	(0.553)	(0.660)	(0.475)	(0.077)	(0.106)	(0.322)	(0.338)	(0.948)	(0.901)	(0.491)	(0.414)	(0.471)	(0.628)	(0.275)	(0.412)	x	(0.143)

List of abbreviations:
WR = women ratio
Ind1 = Consumer Discretionary
Ind2 = Consumer Staples
Ind3 = Energy
Ind4 = Financials
Ind5 = Health Care
Ind6 = Industrials
Ind7 = Information Technology
Ind8 = Materials
Ind9 = Telecommunication Services

Notes:

a. IndX*WR is the interaction term between the companies within industry X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (stock returns) and x-variable (women ratio) among companies in the reference industry, and the corresponding *p*-values.
c. One industry (Utilities) was excluded from the analysis since there were no companies in the data that belonged to this industry.
d. Note that the shaded areas are mirrored with the opposite sign.
e. Significant (p-value < 5 %) differences between regression slopes are in bold.

Revenue

Age group		Age1	Age1*WR	Age2	Age2*WR	Age3	Age3*WR
Reference group	Constant						
Age1	0.058	x	0.789	0.218	-1.221	0.410	-1.576
p-value	(0.716)	x	(0.305)	(0.219)	(0.160)	(0.021)	(0.065)
Age2	0.276	-0.218	1.221	x	-0.432	0.192	-0.355
p-value	(0.000)	(0.219)	(0.160)	x	(0.283)	(0.082)	(0.517)
Age3	0.468	-0.410	1.576	-0.192	0.355	x	-0.787
p-value	(0.000)	(0.021)	(0.065)	(0.082)	(0.517)	x	(0.035)

List of the variables:
WR = women ratio
Age1 = Companies registered before year 1939
Age2 = Companies registered years 1939-1987
Age3 = Companies registered from year 1988 and further

Notes:

a. AgeX*WR is the interaction term between the companies within age group X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (revenues) and x-variable (women ratio) among companies in the reference group, and the corresponding *p*-values.
c. Note that the shaded areas are mirrored with the opposite sign.
d. Significant (p-value < 5 %) differences between regression slopes are in bold.

Geographical location		Loc1	Loc1*WR	Loc2	Loc2*WR
Reference group	Constant				
Loc1	0.411	x	-0.637	-0.159	0.314
p-value	(0.000)	x	(0.051)	(0.131)	(0.559)
Loc2	0.252	0.159	-0.314	x	-0.323
p-value	(0.001)	(0.131)	(0.559)	x	(0.449)

List of the variables:
WR = women ratio
Loc1 = Based in Stockholm county
Loc2 = Not based in Stockholm county

Notes:

a. LocX*WR is the interaction term between the companies within location group X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (revenues) and x-variable (women ratio) among companies in the reference group, and the corresponding *p*-values.
c. Note that the shaded areas are mirrored with the opposite sign.
d. Significant (p-value < 5 %) differences between regression slopes are in bold.

Industry		Ind1	Ind1*WR	Ind2	Ind2*WR	Ind3	Ind3*WR	Ind4	Ind4*WR	Ind5	Ind5*WR	Ind6	Ind6*WR	Ind7	Ind7*WR	Ind8	Ind8*WR	Ind9	Ind9*WR
Reference industry	Constant																		
Ind1	0.100	x	-0.035	-0.124	0.091	0.453	2.774	0.305	0.034	0.314	0.199	0.177	-0.561	0.249	-0.566	0.011	0.035	0.462	-1.403
p-value	(0.576)	x	(0.965)	(0.859)	(0.962)	(0.166)	(0.435)	(0.163)	(0.973)	(0.206)	(0.862)	(0.394)	(0.545)	(0.221)	(0.557)	(0.974)	(0.984)	(0.172)	(0.403)
Ind2	-0.024	0.124	-0.091	x	0.056	0.577	2.683	0.429	-0.057	0.438	0.108	0.301	-0.652	0.373	-0.657	0.135	-0.056	0.586	-1.494
p-value	(0.971)	(0.859)	(0.962)	x	(0.974)	(0.427)	(0.489)	(0.532)	(0.976)	(0.529)	(0.956)	(0.659)	(0.720)	(0.584)	(0.721)	(0.853)	(0.981)	(0.423)	(0.516)
Ind3	0.553	-0.453	-2.774	-0.577	-2.683	x	2.739	-0.149	-2.740	-0.140	-2.575	-0.277	-3.335	-0.204	-3.340	-0.443	-2.739	0.009	-4.177
p-value	(0.044)	(0.166)	(0.435)	(0.427)	(0.489)	x	(0.429)	(0.622)	(0.437)	(0.666)	(0.469)	(0.347)	(0.340)	(0.483)	(0.341)	(0.253)	(0.471)	(0.982)	(0.268)
Ind4	0.404	-0.305	-0.034	-0.429	0.057	0.149	2.740	x	0.000	0.009	0.164	-0.128	-0.595	-0.056	-0.600	-0.294	0.001	0.158	-1.437
p-value	(0.001)	(0.163)	(0.973)	(0.532)	(0.976)	(0.622)	(0.437)	x	(1.000)	(0.966)	(0.876)	(0.437)	(0.465)	(0.727)	(0.484)	(0.329)	(1.000)	(0.616)	(0.375)
Ind5	0.413	-0.314	-0.199	-0.438	-0.108	0.140	2.575	-0.009	-0.164	x	0.164	-0.137	-0.760	-0.065	-0.765	-0.303	-0.163	0.148	-1.601
p-value	(0.017)	(0.206)	(0.862)	(0.529)	(0.956)	(0.666)	(0.469)	(0.966)	(0.876)	x	(0.843)	(0.498)	(0.431)	(0.744)	(0.445)	(0.349)	(0.926)	(0.658)	(0.346)
Ind6	0.276	-0.177	0.561	-0.301	0.652	0.277	3.335	0.128	0.595	0.137	0.760	x	-0.596	0.072	-0.005	-0.166	0.596	0.286	-0.842
p-value	(0.009)	(0.394)	(0.545)	(0.659)	(0.720)	(0.347)	(0.340)	(0.437)	(0.465)	(0.498)	(0.431)	x	(0.230)	(0.617)	(0.995)	(0.572)	(0.716)	(0.351)	(0.591)
Ind7	0.349	-0.249	0.566	-0.373	0.657	0.204	3.340	0.056	0.600	0.065	0.765	-0.072	0.005	x	-0.601	-0.238	0.601	0.213	-0.837
p-value	(0.000)	(0.221)	(0.557)	(0.584)	(0.721)	(0.483)	(0.341)	(0.727)	(0.484)	(0.744)	(0.445)	(0.617)	(0.995)	x	(0.287)	(0.413)	(0.717)	(0.483)	(0.598)
Ind8	0.110	-0.011	-0.035	-0.135	0.056	0.443	2.739	0.294	-0.001	0.303	0.163	0.166	-0.596	0.238	-0.601	x	0.001	0.451	-1.438
p-value	(0.687)	(0.974)	(0.984)	(0.853)	(0.981)	(0.253)	(0.471)	(0.329)	(1.000)	(0.349)	(0.926)	(0.572)	(0.716)	(0.413)	(0.717)	x	(1.000)	(0.255)	(0.505)
Ind9	0.562	-0.462	1.403	-0.586	1.494	-0.009	4.177	-0.158	1.437	-0.148	1.601	-0.286	0.842	-0.213	0.837	-0.451	1.438	x	-1.437
p-value	(0.051)	(0.172)	(0.403)	(0.423)	(0.516)	(0.982)	(0.268)	(0.616)	(0.375)	(0.658)	(0.346)	(0.351)	(0.591)	(0.483)	(0.598)	(0.255)	(0.505)	x	(0.333)

List of abbreviations:
WR = women ratio
Ind1 = Consumer Discretionary
Ind2 = Consumer Staples
Ind3 = Energy
Ind4 = Financials
Ind5 = Health Care
Ind6 = Industrials
Ind7 = Information Technology
Ind8 = Materials
Ind9 = Telecommunication Services

Notes:

a. IndX*WR is the interaction term between the companies within industry X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (revenues) and x-variable (women ratio) among companies in the reference industry, and the corresponding *p*-values.
c. One industry (Utilities) was excluded from the analysis since there were no companies in the data that belonged to this industry.
d. Note that the shaded areas are mirrored with the opposite sign.
e. Significant (p-value < 5 %) differences between regression slopes are in bold.

ROA

Age group		Age1	Age1*WR	Age2	Age2*WR	Age3	Age3*WR
Reference group	Constant						
Age1	0.083	x	-0.083	-0.048	0.119	-0.124	0.189
p-value	(0.009)	x	(0.587)	(0.176)	(0.489)	(0.000)	(0.266)
Age2	0.035	0.048	-0.119	x	0.036	-0.076	0.070
p-value	(0.023)	(0.176)	(0.489)	x	(0.649)	(0.001)	(0.523)
Age3	-0.041	0.124	-0.189	0.076	-0.070	x	0.106
p-value	(0.008)	(0.000)	(0.266)	(0.001)	(0.523)	x	(0.156)

List of the variables:
WR = women ratio
Age1 = Companies registered before year 1939
Age2 = Companies registered years 1939-1987
Age3 = Companies registered from year 1988 and further

Notes:

a. AgeX*WR is the interaction term between the companies within age group X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (ROA) and x-variable (women ratio) among companies in the reference group, and the corresponding *p*-values.
c. Note that the shaded areas are mirrored with the opposite sign.
d. Significant (p-value < 5 %) differences between regression slopes are in bold.

Geographical location		Loc1	Loc1*WR	Loc2	Loc2*WR
Reference group	Constant				
Loc1	0.006	x	0.094	0.008	-0.106
p-value	(0.652)	x	(0.153)	(0.705)	(0.329)
Loc2	0.014	-0.008	-0.106	x	-0.013
p-value	(0.371)	(0.705)	(0.329)	x	(0.884)

List of the variables:
WR = women ratio
Loc1 = Based in Stockholm county
Loc2 = Not based in Stockholm county

Notes:

a. LocX*WR is the interaction term between the companies within location group X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (ROA) and x-variable (women ratio) among companies in the reference group, and the corresponding *p*-values.
c. Note that the shaded areas are mirrored with the opposite sign.
d. Significant (p-value < 5 %) differences between regression slopes are in bold.

Industry		Ind1	Ind1*WR	Ind2	Ind2*WR	Ind3	Ind3*WR	Ind4	Ind4*WR	Ind5	Ind5*WR	Ind6	Ind6*WR	Ind7	Ind7*WR	Ind8	Ind8*WR	Ind9	Ind9*WR
Reference industry	Constant																		
Ind1	0.041	x	0.095	0.098	-0.131	0.086	-0.069	-0.018	-0.066	-0.124	-0.136	-0.002	-0.044	-0.067	-0.058	0.017	-0.104	0.038	-0.201
p-value	(0.241)	x	(0.535)	(0.475)	(0.728)	(0.180)	(0.921)	(0.671)	(0.740)	(0.011)	(0.543)	(0.970)	(0.811)	(0.092)	(0.758)	(0.789)	(0.762)	(0.646)	(0.617)
Ind2	0.139	-0.098	0.131	x	-0.036	-0.012	0.062	-0.116	0.065	-0.221	-0.005	-0.099	0.087	-0.165	0.072	-0.081	0.027	-0.060	-0.070
p-value	(0.294)	(0.475)	(0.728)	x	(0.918)	(0.935)	(0.935)	(0.389)	(0.859)	(0.104)	(0.990)	(0.458)	(0.807)	(0.217)	(0.841)	(0.572)	(0.953)	(0.695)	(0.890)
Ind3	0.127	-0.086	0.069	0.012	-0.062	x	0.027	-0.104	0.003	-0.210	-0.067	-0.088	0.025	-0.153	0.010	-0.069	-0.035	-0.048	-0.132
p-value	(0.018)	(0.180)	(0.921)	(0.935)	(0.935)	x	(0.969)	(0.078)	(0.997)	(0.001)	(0.924)	(0.129)	(0.971)	(0.007)	(0.988)	(0.364)	(0.962)	(0.603)	(0.865)
Ind4	0.023	0.018	0.066	0.116	-0.065	0.104	-0.003	x	0.029	-0.106	-0.070	0.017	0.022	-0.049	0.008	0.035	-0.038	0.056	-0.135
p-value	(0.349)	(0.671)	(0.740)	(0.389)	(0.859)	(0.078)	(0.997)	x	(0.815)	(0.011)	(0.734)	(0.605)	(0.888)	(0.114)	(0.964)	(0.550)	(0.909)	(0.477)	(0.730)
Ind5	-0.083	0.124	0.136	0.221	0.005	0.210	0.067	0.106	0.070	x	-0.040	0.122	0.092	0.057	0.077	0.141	0.032	0.162	-0.065
p-value	(0.014)	(0.011)	(0.543)	(0.104)	(0.990)	(0.001)	(0.924)	(0.011)	(0.734)	x	(0.803)	(0.002)	(0.626)	(0.143)	(0.693)	(0.026)	(0.927)	(0.049)	(0.872)
Ind6	0.039	0.002	0.044	0.099	-0.087	0.088	-0.025	-0.017	-0.022	-0.122	-0.092	x	0.052	-0.066	-0.015	0.019	-0.060	0.040	-0.157
p-value	(0.057)	(0.970)	(0.811)	(0.458)	(0.807)	(0.129)	(0.971)	(0.605)	(0.888)	(0.002)	(0.626)	x	(0.595)	(0.020)	(0.920)	(0.746)	(0.851)	(0.611)	(0.682)
Ind7	-0.026	0.067	0.058	0.165	-0.072	0.153	-0.010	0.049	-0.008	-0.057	-0.077	0.066	0.015	x	0.037	0.084	-0.045	0.105	-0.142
p-value	(0.172)	(0.092)	(0.758)	(0.217)	(0.841)	(0.007)	(0.988)	(0.114)	(0.964)	(0.143)	(0.693)	(0.020)	(0.920)	x	(0.738)	(0.139)	(0.889)	(0.174)	(0.713)
Ind8	0.058	-0.017	0.104	0.081	-0.027	0.069	0.035	-0.035	0.038	-0.141	-0.032	-0.019	0.060	-0.084	0.045	x	-0.008	0.021	-0.097
p-value	(0.279)	(0.789)	(0.762)	(0.572)	(0.953)	(0.364)	(0.962)	(0.550)	(0.909)	(0.026)	(0.927)	(0.746)	(0.851)	(0.139)	(0.889)	x	(0.978)	(0.820)	(0.840)
Ind9	0.079	-0.038	0.201	0.060	0.070	0.048	0.132	-0.056	0.135	-0.162	0.065	-0.040	0.157	-0.105	0.142	-0.021	0.097	x	-0.105
p-value	(0.293)	(0.646)	(0.617)	(0.695)	(0.890)	(0.603)	(0.865)	(0.477)	(0.730)	(0.049)	(0.872)	(0.611)	(0.682)	(0.174)	(0.713)	(0.820)	(0.840)	x	(0.776)

List of abbreviations:
WR = women ratio
Ind1 = Consumer Discretionary
Ind2 = Consumer Staples
Ind3 = Energy
Ind4 = Financials
Ind5 = Health Care
Ind6 = Industrials
Ind7 = Information Technology
Ind8 = Materials
Ind9 = Telecommunication Services

Notes:

a. IndX*WR is the interaction term between the companies within industry X and the women ratio.
b. The numerical values in the non-shaded areas are the estimates of association between y-variable (ROA) and x-variable (women ratio) among companies in the reference industry, and the corresponding *p*-values.
c. One industry (Utilities) was excluded from the analysis since there were no companies in the data that belonged to this industry.
d. Note that the shaded areas are mirrored with the opposite sign.
e. Significant (p-value < 5 %) differences between regression slopes are in bold.

Appendix 7: Comments to Figure 5.1