Stockholm School of Economics
Department of Finance
4350 Thesis in Finance

Investing in gender equal companies

- an attractive strategy?

Christina Engelberth & Julia Hellgren

December 2016

In this thesis we investigate whether gender equality enhances firm performance, if equal firms are less risky compared to unequal firms and if investors can profit from this. To evaluate performance and risk we create trading strategies and form portfolios of equal and unequal companies during the period March 2011 to August 2016. We test if the equal portfolio performs better and infers less risk compared to the unequal portfolio by running time series regressions on the returns of the portfolios and analyzing performance and risk. The results from our study show significant lower market betas in five out of six regressions for the equal portfolio compared to the unequal portfolio, indicating that the equal portfolio infers less risk. In terms of the performance, we are unable to draw certain conclusions regarding any excess return as a result of investments in equal companies but we can conclude that there is no significant difference in returns between the portfolios. Hence, our results imply that for investors who are not only concerned with profit but also with gender equality and socially responsible investing, the cost is not higher when investing in equal companies and the risk is lower.

Key words: gender equality, performance, risk, socially responsible investing, trading strategy

Acknowledgement: We would like to thank our tutor, Anders Anderson, for valuable support and guidance.

Christina Engelberth, 22369@student.hhs.se
Julia Hellgren, 22212@student.hhs.se

Table of Contents

List of Tables and Figures

Appendix

1. Introduction

The absence of females in corporate senior positions in Swedish listed companies is currently a hot topic for both politicians and business leaders. This has forced companies to consider the gender distribution across their entities. Previous research has shown that an equal gender distribution can affect companies positively (Catalyst, 2007). There is a demand in the market for gender equality, and active equality work has become a way of improving companies' image and attractiveness. With this study we intend to add valuable insights to the debate of gender diversity in corporations by investigating its effect on performance and risk. Moreover, our conclusions will provide investors with a new perspective when making investment decisions.

Gender equality can positively affect the financial performance of a company. According to Avanza (2016), equal companies have had twice the return compared to the OMX Stockholm Price Index (OMXSPI) during the past 3 years. By presenting a list of equal companies, Avanza introduces a potential trading strategy for investors concerned with gender equality. In addition, a report by McKinsey (2015) states that companies in the top quartile for gender diversity are 15% more likely to have financial returns above their national industry medians. The improved company performance has been argued to be a result of better quality decision making due to diverse boards (European Commission, 2012). Though these findings are interesting, the studies do not stem from academic research.

Much academic research has been conducted to examine the relationship between gender diversity and performance (Carter, Simkins and Simpson, 2003; Smith, Smith and Verner, 2006; Adams and Ferreira, 2009). However, all studies do not reach the same conclusion regarding how performance is affected by gender equality. Some claim that it enhances performance (Carter, Simkins and Simpson, 2003 & Smith, Smith and Verner, 2006), while others suggest the opposite (Adams and Ferreira, 2009). What makes studying gender diversity interesting is that potential differences in characteristics can be identified between men and women. These differences will affect decisions taken in the company and therefore in what direction a firm is steered. There is in fact research that has found fundamental differences between men and women. One of these differences is associated with risk propensity (Croson and Gneezy, 2009). It has in many cases been pointed out that women generally take less risk than men (Sapienza, Zingales and Maestripieri, 2009). Since risk propensity is closely related to decision making in corporate settings, as is performance, we want to incorporate both risk and performance when studying gender diversity effects. Combining these

two factors will give valuable insight into how performance and risk are affected by gender diversity and how investors might incorporate this in their trading strategies.

With this thesis we aim to answer if investments in equal companies enhance performance and infer less risk compared to investments in unequal companies. Simply put, we intend to figure out if equal firms do better. To reflect on how investors incorporate gender effects on risk and performance, it is important to take the perspective of an investor. Making socially responsible investments (SRI) have become increasingly popular because it lets investors combine financial objectives with their social values (Hill et al., 2006). Investing in gender equality is an important part of a larger discussion regarding SRI and if gender equality effects on performance and risk can be determined, perhaps better conclusions can be drawn regarding investment decisions. We evaluate if SRI concerning gender equality can create advantageous trading strategies by constructing portfolios based on company equality rankings.

In line with previous research, with ambiguous conclusions regarding gender equality effects on performance, the findings from our study leave us unable to draw any certain conclusions regarding any potential enhanced performance as a result of investments in equal companies. However, our findings suggest that for investors who are not only concerned with profit but also gender equality and SRI, the cost is not higher when investing in equal companies compared to unequal companies since there is no difference in returns. In terms of risk, we can conclude that equal companies are associated with less risk compared to unequal companies. The clear majority of previous research on the relationship between risk and gender reach the same conclusion.

The rest of the paper is organized as follows. Previous research within the field is outlined in section 2. Subsequent to section 2, our research question is developed and presented in the end of section 3. Section 4 covers data used in our research and section 5 the methodology used. The methodology covers performance evaluation, portfolio construction, trading strategy and the regression model used for our analysis. In section 6 we present our results and analysis with discussion and concluding remarks in section 7. References and appendix can be found in section 8 and 9 respectively.

2. Previous Research and Theoretical Framework

2.1. Previous Research

Previous research shows that there is a genuine interest in trying to determine how and if gender diversity improves performance and how this might affect investors' investment decisions. Though numerous academic studies have been conducted, the empirical evidence of firm performance due to gender diversity is ambiguous. While many authors find gender diversity to have a positive effect on performance, several other analyses have come to the opposite conclusion that it has a negative or no effect. Hence, it is not obvious if and how gender diversity affects performance. On a more individual level, a lot of research has been done to find how women and men differ in terms of risk propensity. These studies are much less ambiguous as the majority of authors agree on that women are more risk averse than men. Since gender equality is a part of social responsibility, it makes sense to shed light on previous research within this field, showing that many investors increasingly adopt socially responsible investing. There is a general consensus of the importance, profit and moral motives of socially responsible investing. Investors are concerned with performance and risk, while at the same time it is increasingly important to fulfill social values. Combining these three perspectives; performance, risk and SRI, we will outline the most important research in this section. We will build on this as we carry out our study and aim to answer our research question.

2.1.1. Performance

At first, previous studies that examine the relationship between gender diversity and performance will be highlighted. Performance is studied in a corporate setting with focus on the effects of an increased number of women on board or top management level because vital decisions are taken at this level that can affect firm performance. The studies that find gender equality to have a positive effect on performance will be presented in the beginning, followed by those who do not find a positive effect on performance.

2.1.1.1. Positive effect due to gender equality

The dearth of females in top management positions and corporate boards is an emerging political issue and has for long been a hot topic for debate. Several studies point out that firms with a higher share of women perform better. The European Commission (2012) argues that more gender diverse boards lead to improved company performance and better quality of decision making. A study by McKinsey suggests that there are not enough women in business and that companies with boards and top-management positions where females are strongly represented are also the firms that perform best (McKinsey and Company, 2007). Another study by Catalyst (2007) supports the

findings that more female directors leads to higher performance by analyzing companies on the Fortune 500 list. The results suggest that companies with more women board directors outperform others in terms of return on equity, return on sales and return on invested capital. The value of diversity is further emphasized by Credit Suisse (2012), showing through analysis that it would have been better to have invested in corporates with women on their management boards than those without over the past six years.

Similar findings have been put forth by Carter, Simkins and Simpson (2003), where significant positive relationships between the fraction of women on the board and firm value is found. The research investigates Fortune 1,000 listed US companies and it is proven that firms with at least two women on their boards generate higher Tobin's Q ratios than firms with lower representation of women. Other research on US firms find that more balanced gender distribution among corporate leaders is positively associated with stock values and firm performance (Erhardt, Werbel, and Shrader, 2003).

Smith, Smith and Verner (2006) studied 2,500 Danish firms during the period 1993-2001. The results show that the effects of a larger proportion of female CEOs or female board of directors are positive when it comes to firm performance. However, the conclusion is ambiguous and any effect on firm performance is highly dependent on the qualifications of the women in top management. Firm performance effects depend both on which performance measure that is used and the measure of the proportion of women in management. Some performance measures are affected more positively and more significantly than others. The results also show that female CEOs without a university degree have much smaller or insignificant effect on firm performance, while female managers who hold a university degree have a greater effect on firm performance (Smith, Smith and Verner 2006).

In line with Smith's, Smith's and Verner's research (2006), Francoeur, Labelle and Sinclair-Desgagné (2008) have concluded that firms operating in complex environments do generate positive and significant abnormal returns when they have a high proportion of women officers. The valuation framework of Fama and French was used to take risk into account rather than looking at raw stock returns or accounting ratios. Significant excess returns were not identified as a result of more women on corporate boards and/or top management. This means that firms with a high proportion of women in both management and governance systems create enough value to keep up with "normal" stock-market returns. However, this might mean that female directors perform better than male counterparts because women are starting in worse positions compared to men (Francoeur, Labelle and Sinclair-Desgagné, 2008).

Many studies on gender diversity effects on profitability are done on a national basis. Noland, Moran and Kotschwar (2016) have conducted a global survey of 21,980 firms from 91 countries in order to determine whether gender diversity is profitable or not. The findings suggest that women in corporate leading positions may improve firm performance. The greatest impact was found for female executive shares followed by female board shares. Statistical results show that the size of the company and the size of the board are robustly positively correlated with the presence of women in corporate leading positions. No evidence of significant effects on firm performance due to female board quotas was uncovered.

2.1.1.2. No positive effect due to gender equality

Despite the fact that several research has come to the conclusion that gender diversity enhances firm performance, it is still not definitely determined. Past evidence on the impact of a greater number of women in leading positions has been mixed. Adams and Ferreira (2009) find that the effect of gender diversity on firm performance is negative, even after addressing endogenity problems. The results show that gender diverse boards allocate more effort to monitor managers' decision making processes. Some companies may be in need of increased monitoring and hence benefit from gender diversity, while other companies do worse with diversity (Adams and Ferreira, 2009).

Similar findings is reached by Ahern and Dittmar (2012) who examine the effects of the enforced Norwegian law, requiring at least 40% of the firm's board of directors to be women. The authors show that the market reacted negatively to the quota law; stock prices declined at announcement and performance worsened over the following years. The new female directors changed multiple characteristics of boards as the new directors were younger and had significantly less CEO experience. Leverage increased and operating performance deteriorated (Ahern and Dittmar, 2012).

Another study that examines the effects of the Norwegian quota law is done by Matsa and Miller (2013). In line with Ahern and Dittmar, they find that the imposed quota law reduced firm performance. However, the authors disagree with Ahern and Dittmar regarding the decreased age and lack of experience that the new directors brought to the boards and instead claim that their results is due to female leadership styles. For example, the firms with a higher share of females acted to a greater extent in favor of employees. Fewer workforce reductions were undertaken which led to increased labor costs and employment levels, which reduced short-term profits.

Randøy, Thomsen and Oxelheim (2006) find no significant impact on firm performance due to gender diversity. Their study is based on the 500 largest firms from Sweden, Norway and Denmark. Neither stock market performance nor the return on assets implied any significant effect as a result of gender diversity. Similarly, O'Reilly, and Main (2012) find no evidence that firm performance is enhanced if more women are added to the boards. The study is conducted based on observations from 2,000 firms over the period 2001-2005 in order to examine the effects of female directors on firm performance and CEO compensation. Evidence was found that male CEOs with higher compensation are more likely to appoint women. The authors interpret the results as appointments of women to the boards are generally done for normative rather than profit-seeking motives.

2.1.2. Risk

In contrast to research on the relationship between performance and gender diversity, the studies with regard to gender and risk propensity are done on an individual level in order to capture the differences in characteristics of men and women. This is important because the level of risk aversion of an individual will have an impact on decisions taken in a corporate setting. Previous research on the relationship between gender and risk will therefore be presented next.

2.1.2.1. Women are more risk averse than men

The European Commission (2012) states, "a gender-balanced board is more likely to pay attention to managing and controlling risk". Furthermore, the study by Eckel and Grossman (2008) examines risk aversion in the behavior of men and women. It is argued that women's risk sensitivity is reflected in all aspects of their decision making such as investment decisions, the choice of profession and what products to buy. In most cases, women are found to be more risk averse than men.

The same observation is done by Jianakoplos and Bernasek (1998) who find that women are more risk averse than men in financial decision making. The authors examine holdings of risky assets by analyzing US households and find that women are more risk averse in their decision making relative to men. The research finds that 63 percent of single women are unwilling to take on any risk in their investments while the percentage for single men was 43. The authors also conclude that the identified risk aversion could explain the lower wealth levels for women compared to men.

A study that further supports the claim that men are less risk averse than women is the physiological study by Bymes, Miller and Schafer (1999). The research is a meta-analysis of 150 studies where very consistent results of higher risk aversion among women than among men are reported. Certain topics, such as intellectual risk taking and physical skills, produced larger gender differences than

others. The authors also found that the size of the gender gap shifted significantly between successive age levels.

Adams and Ferreira (2004) conducted a study with a cross-sectional sample of 1,024 public companies in 1998. One of the results from the study was that firms which were facing more variability in their stock returns had fewer women on their board of directors. The authors show that there is a very strong and robust negative relationship between diversity and risk.

Another study by Elsaid and Ursel (2009) examines CEO successions and how risk taking is affected. The authors seek to investigate whether personal attitudes influence decisions that are made when governance positions in corporations are held. During the years 1992-2005, 758 CEO successions are studied in 650 small-, medium- and large-cap, North American firms. Risk measures such as financial leverage, research and development expenses and cash holdings are used in order to determine whether the risk attitudes are changing in relation to the gender of the CEO. The results from the study indicate that successor CEOs anchor to the status quo when it comes to status and gender. Female CEOs are associated with less firm risk taking.

2.1.2.2. Men are more risk averse than women

On the contrary, Adams and Funk (2012) find that female directors are less risk averse than male directors and go on to conclude that women on the board may not lead to more risk averse decision making. The study shows that core values and risk attitudes differ systematically among female and male directors, but in ways that differ from gender differences in the general population. The authors mention that previous studies have proved women to be more risk averse than men, but if it is necessary for women to be like men in order to break the glass ceiling, gender differences might be expected to vanish among directors (Adams and Funk, 2012).

2.1.3. Socially Responsible Investing

Investing in gender equal companies is part of a larger debate that deals with SRI. To reflect on how investors incorporate the two factors risk and performance in combination with social values, it is useful to take the perspective of an investor. The consensus of the importance of SRI is essential in order to draw conclusions on how gender equality is incorporated in investing decisions when it comes to performance and risk. A background on previous findings is therefore presented below to finish the section of previous research.

2.1.3.1. Performance and Socially Responsible Investing

SRI is a long-term oriented investment approach integrating environmental, social and governance factors when selecting securities to construct a portfolio (Eurosif, 2016). SRI can be described as

investments enabling investors to combine financial objectives with their social values. The investor's objective is still to receive a fair return but at the same time accomplish Corporate Social Responsibility (CSR) goals (Hill et al., 2006), where the gender equality debate can be seen as an important part of the larger CSR discussion.

According to Lougee and Wallace (2008) there are two different motives behind CSR investments; the moral motive and the economic motive. The economic view of a long-term shareholder on a CSR investment should be the same as any corporate investment decision. Namely that the expected return should at least be equal to the cost of capital and concluding that corporations spend resources on CSR in order to maximize shareholder value rather than upholding stakeholder commitments. Sparkes and Cowton (2004) further investigate the economic link between SRI and CSR and argue that it has become an investment philosophy adopted by a growing number of institutional investors.

The grand focus on CSR has led to several research within the field in attempts to figure out whether it is worthwhile for companies to pay attention to the demands of society. Balabanis, Philips and Lyall (1998) investigate the relationship between CSR and economic performance of corporations through 56 large UK companies. The results show negative correlations between financial performance and involvement in environmental protection activities, while a firm's policies regarding positions of women seemed to be more rewarding in terms of positive capital market responses (Balabanis, Philips and Lyall, 1998).

Guerard (1997), examines the returns of an unscreened equity universe of 1,300 stocks and a socially screened equity universe of around 950 stocks and finds that significant outperformance was generated in the socially screened investment universe. The author concludes that it is not "dumb" to be socially conscious as an investor, rather it is necessary to look at how managers implement the investment process (Guerard, 1997).

Kempf and Osthoff (2007) take the discussion of investing socially conscious further by implementing a trading strategy based on socially responsible ratings where the top ranked stocks are bought and the stocks with low rankings are sold. They found that this strategy led to significant, high abnormal returns of up to 8.7% per year. On the other hand, Diltz (1995) examines 28 stock portfolios to determine if ethical screening has an impact on portfolio performance where the analysis shows little impact.

2.1.3.2. Risk and Socially Responsible Investing

The SRI can also be studied from a risk perspective, where Hong and Kacperczyk (2009) study the effects of social norms by examining the investing environment of sin stocks, which are publicly traded companies who are involved in the production of alcohol, tobacco and gambling. Sin stocks are less held by institutions such as pension plans, which are norm-constrained investors, as compared to mutual or hedge funds. The authors find that the sin stocks have higher expected returns than otherwise comparable stocks. This is consistent with sin stocks being associated with increased litigation risk. The risk is further heightened by social norms and neglecting by norm-constrained investors (Hong and Kacperczyk, 2009).

2.2. Theoretical Framework

2.2.1. Single Index Model

Markowitz (1952) state that the single index model predicts the relationship between an asset's expected return and the market index. The sensitivity to the market is measured by beta; the systematic risk. Since the single index model includes expected returns, there will be stocks that generate higher and lower returns than those predicted by the model. Hence, the stocks will yield positive or negative alphas (Markowitz, 1952). There are various methods for measuring firm performance, which vary a lot depending on company, industry, size etc. Alpha in the single index model measures performance in the form of abnormal returns (Markowitz, 1952).

2.2.2. Multifactor Model

The single index model decomposes stock variability into systematic and idiosyncratic effects where the return on a market index is used as a proxy for the market and the systematic risk factors. The multifactor model takes more factors of risk into account and allow us to add factors that affect the return of a stock beyond the market risk. A well-known multifactor model is the Fama and French three factor model. In the Fama and French three factor model, firm characteristics are used as proxy for the exposure to systematic risk. Past evidence has shown that these factors capture risk premiums well. The first factor in the model is the market risk premium, like in the single index model. The second factor is firm size and is called the SMB factor, which is the return of a portfolio of small stocks in excess of the return on a portfolio of large stocks. The third factor is the book-to-market ratio, called the HML factor, which is the return of a portfolio of stocks with high book-to-market ratio in excess of the return on a portfolio of stocks with a low book-to-market ratio (Fama and French, 1992).

2.3. Definitions

2.3.1. Performance

Performance will be evaluated in terms of returns. Abnormal returns will be analyzed in our regression models through alpha. We will also analyze raw returns in order to identify differences between portfolios. Performance will be discussed both on a firm, portfolio and investment level, but the definition of performance within each context remains the same.

2.3.2. Risk

When evaluating risk, the measure beta will be used. A lower beta indicates lower risk, while a higher beta indicates higher risk. For discussion purposes, other risk measures will be mentioned, such as Sharpe ratio and volatility, but beta will be our defined risk measure. Risk will be discussed both on an individual, firm, portfolio and investment level, but the definition of risk within each context remains the same.

2.3.3. Equality

For the purpose of this thesis, a clear definition of the meaning of equal and unequal companies is necessary. The Allbright Foundation releases reports on a yearly basis where the gender diversity in Swedish listed companies are mapped out. Included in the reports is a classification of companies designated to a white list and companies designated to a black list. The list on which a company appears, black or white, depends on certain criteria prioritized in the following order: 1. Share of women in management positions, 2. Share of women in the business line and 3. Share of women on the board. 2011-2014, one female management representative was enough for the company to be assigned to the white list. From 2014 and going forward the companies on the white list are required to have at least 40% women in management. Companies assigned to the black list have no women in top management. Throughout this thesis, a company that is designated to the white list in a given year is defined as an equal company. Similarly, a company that is designated to the black list in a given year, is defined as an unequal company.

3. Contribution and Research Question

Previous research proves that gender diversity is a hot topic when it comes to its effect on firm performance and risk. Several studies have been conducted in trying to understand the impact of an increased number of women in corporate leading positions. However, the effect on firm performance and risk is often analyzed in separate studies and few incorporate these two parameters in the same study.

Furthermore, it is common to analyze the effects of gender diversity with a focus on an increased number of women on boards or CEOs. We take the analysis one step further by taking into account more aspects of gender diversity, which stretches beyond board composition. As mentioned above, we define equality by prioritizing the share of women in management positions, share of women in the business line and at last, share of women on the board. Consequently, our study differs from others with a narrow focus on board of directors and analyzes equal and unequal companies with a more defined set of equality factors.

Though a lot of research has been done within the field, many of these have been conducted several years, sometimes decades ago. Our study provides evidence during a much more recent time span. This is important to mention especially when it comes to SRI since both gender equality and SRI has gained a substantially increased focus in society and in corporations in recent years.

Our study also differentiates from previous research since we construct portfolios based on a trading strategy which lets us analyze actual returns of investments in equal versus unequal companies. Previous studies have mainly focused on performance on a company level but we include the perspective of an investor by studying different portfolios. Research has been done regarding the attractiveness of SRI, but we focus on the gender equality aspect in this context by analyzing if gender equality can be foundation for an attractive trading strategy. We aim to figure out whether equal companies do better. Hence, this study seeks to answer the question:

"Do investments in equal companies enhance performance and infer less risk compared to investments in unequal companies?"

We believe that our research will add valuable insight into the debate of gender diversity in corporations and that our conclusions will provide investors with new perspective when making investment decisions. We trust that our results will contribute to the ongoing discussion on SRI and add new features to previous findings within gender equality research.

4. Data

4.1. Presentation of sample

The companies in our sample have been retrieved from the Allbright yearly reports (Allbright, 2012-2016). Our time period for the data is limited to five years and ranges from March 1, 2011 to August 31, 2016. Our sample consists of 286 small-, mid- and large cap companies that are or have been listed on the Stockholm Stock Exchange during our defined time period. Due to the fact that all companies are or have been listed throughout the observed time period we have avoided issues usually associated with smaller companies such as low liquidity, volatile earnings etc. Listed companies are also obligated to follow more rules and regulations compared to unlisted companies, which often implies more accurate and higher quality information (NASDAQ, 2016). Each year, the sample selection is divided into the categories equal or unequal depending on the specified criteria explained in section 2.3.3. Companies and number of companies designated to a certain category for each year vary during the time period due to changes in the companies' board and employee composition. In 2014 the criteria used by Allbright for companies to be designated to the white list got stricter, which resulted in the number of equal companies to drop in 2014 and going forward (see table 1 for more information). The information obtained by Allbright as a basis for each year's list is collected during December and January, a few months before the report is released.

As previously described, the divisions into equal and unequal companies are done solely through prescribing to Allbright's criteria and classification put forth in their yearly reports released since 2012. No report was released in 2011. However, the ranking of companies for 2011 was disclosed in 2012, which enabled us to categorize our sample companies into equal and unequal in 2011 as well. In our trading strategy we assume this information was known on March 1st, 2011. Choosing our sample based on Allbright's reports lets us avoid the issue of survivorship bias since we each year include companies that may no longer be trading on the Stockholm Stock Exchange following our time period. See table 1 for descriptive statistics of sample and for more detailed information regarding monthly portfolio returns and the inclusion of companies in our different constructed portfolios, see table 8, 9 and 14 in appendix.

Table 1: Descriptive statistics

Table describing the number of companies in the sample each year, and number of firms included in the equal and the unequal portfolio respectively each year. Average monthly returns each year for the market, represented by SIXRX, and average monthly return of portfolios for each year.

Year	Total nr. of firms	Nr. of equal firms	Nr. of unequal firms	Average monthly return of the market	Average monthly return Equally weighted portfolios		Average monthly return Value weighted portfolios	
					Equal	Unequal	Equal	Unequal
2011	253	151	102	-0.33	-1.49	-1.21	-0.30	0.30
2012	254	154	100	0.89	0.58	0.16	0.45	0.91
2013	251	165	86	1.58	2.70	2.18	1.96	1.65
2014	109	27	82	1.91	1.89	1.27	2.56	0.15
2015	106	27	79	0.89	1.56	3.37	1.03	1.93
2016	109	32	77	0.97	1.19	1.53	-0.30	1.51
Unique	286	191	155	-	-	-	-	-

For average monthly returns 10 observations 2011, 12 observations per year 2012-2015 and 8 observations 2016. All returns expressed in percent.

4.2. Approach for obtaining information

Thomson Reuters Datastream has been used to retrieve the daily return index of our selected companies in order to calculate monthly returns. This gives us a theoretical growth in the value of their stocks. The return index assumes that all dividends and distributions are reinvested. For stocks listed on multiple exchanges, only return on the stocks traded on the Stockholm Stock Exchange have been included. For companies with different share classes, the most liquid class has been included in the sample, excluding for example preference shares. Stocks with low per share values can sometimes generate volatile returns. Despite this, these stocks have been kept in our data sample. We have also obtained data on the market capitalization for each company on a monthly basis using Thomson Reuters Datastream. The market capitalization is used to value weight our portfolios. The portfolios are rebalanced monthly and the market capitalization for each month and company is obtained for the 1st day of each month. Information on listings, delisting and other corporate actions that affect the lists have been conducted from NASDAQ. In estimating the market return, SIX Return Index (SIXRX) has been used. The SIXRX includes all companies listed on the Stockholm Stock Exchange, showing the average development on the stock market, including dividends. In order to assess the risk-free rate, monthly data on Swedish Treasury Bills (*Sw. Statsskuldväxlar*) have been collected from Sveriges Riksbank. Swedish Treasury Bills is a promissory note issued by the National Debt Office (*Sw. Riksgäldskontoret*) with a maturity of up to one year.

Data on the Fama and French factors are retrieved from the Kenneth French website. We use the Fama and French European three factors data, with observations from 16 European countries

including Sweden. From the dataset we use the data on the SMB factor and the HML factor. The returns of the SMB and HML portfolio are calculated on a monthly basis for our defined time period.

Table 2: Sources of Data

Summarizing table of the type of data and sources from which it has been obtained.

Source	Data
Thomson Reuters	• Daily return index of portfolio companies. • Market capitalization of portfolio companies.
NASDAQ	• Information on corporate actions.
SIX Financial Information	• Daily return of SIX Return Index.
Sveriges Riksbank	• Monthly Swedish Treasury Bills.
Kenneth French	• Monthly data on Fama and French three factors.

5. Method

In the following section we describe the method used in our study, starting with describing the portfolio construction and trading strategy in detail. We then describe the regression model used to assess the performance characteristics and at last, we outline how performance and risk of the portfolios are evaluated.

5.1. Portfolio Construction and Trading Strategy

Building on previous research, we want to be able to compare and contrast equal companies with unequal companies in order to establish how and if equality has any effect on firm performance and whether companies with larger proportion of women are less risky. Therefore, the stocks of our data sample are divided into portfolios based on their equality rankings published in Allbright's yearly reports. To evaluate the investments we form two portfolios in the beginning of our defined time period, one including the equal companies (the equal portfolio) and one including the unequal companies (the unequal portfolio). Each year we adjust the portfolio in accordance with that year's Allbright list. The Allbright reports are published in February or March each year which is why we set our investment date to the 1st of March. That is, the ranking of firm *i* in time period *t-1* is released on time *t* which is our investment date. Based on the ranking, a company will be assigned to either the equal or the unequal portfolio of the year. It could be that one firm is equal during one year and unequal during next year. A firm can also be on one of the lists during one year and on no list during the next year, due to corporate actions. The portfolios are rebalanced monthly. On the rebalancing day, if the return of a company is missing observations during the coming month, the company is given zero weight in the portfolio during the coming month.

The portfolios will be both equally weighted and value weighted. Equally weighted means that each company regardless of size will have the same weight in the portfolio. Since we want to capture the company characteristics when running our regressions on the returns, an equally weighted portfolio is preferred to a value weighted. The equally weighted portfolio will come with higher trading costs since it is not a buy and hold strategy but the portfolio has to be rebalanced to align returns and keep the equal weights in the portfolio. Hence, there must be an appropriate compromise between the frequency of rebalancing and the amount of trading costs that come with it. We will not include trading costs in our analysis going forward. The portfolios are rebalanced monthly, meaning that in the end of each month at time *t*, the portfolio turnover is calculated in absolute values by taking the weight of stock *i* in the portfolio at time *t-1*, times the monthly return during the time period

between *t-1* and *t*, of stock *i*. Since the portfolio will be equally weighted this means that the weight for stock *i* at time *t* equals:

$$w_{i,t} = \frac{1}{n_{p,t}}$$

Where:

$w_{i,t}$ = the weight of stock *i* at time *t*

$n_{p,t}$ = the number of companies in portfolio *p* at time *t*

In the end of each month, the increase of invested money from returns are equally distributed among the number of assets in the portfolio to determine the weights for the coming month, meaning we sell our winner stocks and buy the losing stocks.

The value weighted portfolios are weighted based on the monthly market capitalization of the firms in the portfolio. The value weighted portfolios will be used as a control group and analyzed in combination with the equally weighted portfolios.

5.2. Regression Model

In order to assess if, and to what extent, equality affects portfolio performance and risk, we perform a time series data analysis. Time series regressions will be run on monthly data of the excess returns of the portfolios as our dependent variable and the excess return of the market portfolio as the independent variable. Additional control variables will also be added to the model to control for other risk factors and fixed effects. Each regression will be based on 66 observations of monthly returns from March 1st, 2011 until August 31st, 2016.

In our regression model, we use a single index model as stated below (Markowitz, 1952):

Equation 1: Single index model

$$(R_{p,t} - R_{f,t}) = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + \varepsilon_p$$

$R_{p,t}$ = return of the portfolio at month t

$R_{f,t}$ = return of the Swedish Treasury Bills at month t (here the monthly risk-free rate)

α_p = intercept of the regression

β_p = regression coefficient

$R_{m,t}$ = return of the SIXRX at month t (here the monthly market return)

ε_p = error term

5.2.1. Model Inputs

The dependent variable in the single index model is the monthly portfolio excess return. To calculate the excess return we need the actual monthly portfolio return, R_p. The actual portfolio return is calculated using the following formula (Bodie, Kane and Marcus, 2011):

$$R_{p,t} = w_{1,t}R_{1,t} + w_{2,t}R_{2,t} + \cdots + w_{n,t}R_{n,t}$$

Where $w_{1,t}$ is the weight of stock 1 in the portfolio at time t and $R_{1,t}$ is the actual return of stock 1 at time t.

To arrive at our dependent variable, the excess return, the risk-free rate R_f is deducted from the actual return $(R_{p,t} - R_{f,t})$. As a proxy for the risk-free rate we use the one month Swedish Treasury Bill. We retrieve monthly data for the Swedish Treasury Bills to match the time frame of our portfolio returns.

In the single index model, R_m is the return of a market index. In our model, the SIXRX is used as a proxy for the return of the market. The SIXRX includes all companies listed on the Stockholm Stock Exchange, showing the average development in the market including dividends. Since the sample used in our study consists of Swedish companies listed on small-, mid- or large cap of the Stockholm Stock Exchange, the SIXRX captures the risk in the studied market and is hence used as a proxy for the market portfolio.

5.2.2. Control Variables

We also want to control for the possibility that there are additional factors explaining the risk in the model. To do so we extend our single index model to a multifactor model including the Fama and French factors, SMB and HML. Since we want to assess the difference in risk between the equal and unequal portfolio we investigate whether other factors than the market excess return explains the excess return of our portfolios. In case we find a pattern of riskiness we want to make sure this is not explained by other known risk factors such as size or book-to-market. Our extended model with the Fama and French factors will look as follows (Fama and French, 1992):

Equation 2: Multifactor model

$$(R_{p,t} - R_{f,t}) = \alpha_p + \beta_{p,m}(R_{m,t} - R_{f,t}) + \beta_{p,SMB}SMB + \beta_{p,HML}HML + \varepsilon_p$$

The SMB and the HML portfolios have been calculated by sorting stocks in a region into two market cap and three book-to-market equity groups. Big stocks are those in the top 90% for the region and small stocks are those in the bottom 10%. The SMB is the equal-weight average of the returns on the three small stocks portfolios for the region minus the average of the returns on the big stock portfolios. The HML is the equal-weight average of the returns for the two high book-to-market portfolios for a region minus the average of the returns for the two low book-to-market portfolios (French, 2016).

The model presented above will be run on monthly returns for each portfolio. Since the monthly observations for each portfolio are spread out during six years we want to control for yearly fixed effects in our regression. For this purpose we generate 5 dummy variables *dum1*, *dum2*, *dum3*, *dum4* and *dum5,* where *dum1* will take on value 1 if the year is 2011 and 0 otherwise. *dum2* will take on value 1 if the year is 2012 and 0 otherwise, and so forth. If the year is 2016 *dum1-dum5* will take on the value zero, hence we generate 5 dummy variables for the 6 years. The intercept α_p will represent the effect for 2016 in the regression results. The regression model including year dummies will look as follows:

Equation 3: Multifactor model controlling for yearly fixed effects

$$(R_{p,t} - R_{f,t}) = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + \beta_{p,SMB}SMB + \beta_{p,HML}HML + \delta_1 dum1 + \delta_2 dum2 + \delta_3 dum3 + \delta_4 dum4 + \delta_5 dum5 + \varepsilon_p$$

5.3. Performance Evaluation

5.3.1. Indexed Returns

As a starting point in our comparison between the equal and unequal portfolio we will index the monthly portfolio returns and plot against the indexed return of the market in order to evaluate if we can see a pattern in the returns of the different portfolios.

5.3.2. Sharpe Ratio

The Sharpe ratio is used to measure the risk adjusted return, by calculating the average excess return per unit of volatility. We will use this measure to get an overview of the attractiveness of our portfolios and its risk adjusted performance. The Sharpe ratio is calculated as follows:

$$SR_p = \frac{R_p - r_f}{\sigma_p}$$

Where, $R_p - r_f$ is the excess return of the portfolio and σ_p is the variance of the portfolio (Bodie, Kane, Marcus 2011).

5.3.3. T-tests

To further analyze the portfolio returns we will perform t-tests on the monthly portfolio returns. For this analysis we will use the returns from the equal and unequal portfolio, including all monthly returns from March 2011 until August 2016. We assume that the variances of the two samples are equal when we test if:

$$\mu_E - \mu_U = D_0 \quad \text{or if} \quad \mu_E - \mu_U \neq D_0$$

where:

μ_E = mean of monthly returns of the equal portfolio

μ_U = mean of monthly returns of the unequal portfolio

D_0 = zero difference between sample means

5.3.4. Single index model

In order to evaluate whether portfolios formed by equal companies can generate abnormal returns we want to examine if the returns can be explained by common risk factors. When regressing the single index model, the output of interest is the coefficient β and the intercept α. By using the single index model framework as presented by Markowitz (1952) in our regressions we can test if the return of our portfolios can be fully explained by the excess return of the market, or if the average return of the portfolio is above or under the return predicted by the market index.

The slope coefficient β is the portfolio's sensitivity to the market index. A lower value implies a less risky portfolio in relation to the changes in the market. The beta coefficient will be a determinant of whether equal companies are less risky compared to unequal companies. If our yielded betas from the regressions are significantly higher than one, this implies a higher risk compared to the market since a high beta portfolio entails above average sensitivity to market swings. Low beta portfolios are on the other hand less sensitive to market swings and hence less risky.

In our regressions we will also examine the intercept of the regression, α. A significant intercept in the model implies abnormal returns, returns not fully explained by the risk in the market. This is the portfolio alpha. If we find significant positive alphas for our equal portfolio this would indicate that equal companies are undervalued and have excess returns because they yield returns above the market index. Beta is the systematic risk premium while alpha is a non-market premium.

5.3.5 Fama and French

To further examine the systematic risk in the regressions we add factors that can be relevant sources of systematic risk using firm characteristics. The three factor model developed by Fama and French

(1992) includes factors that seem to predict average returns well and may capture risk premiums in excess of that captured by the market index. To test this we extend our regression model to include the factors SMB and HML as proxies for firm size and book-to-market ratio. The reasoning Fama and French point out to include these factors are for example that firms with high book-to-market ratios are more likely to be in financial distress. Hence, firms with higher ratios are riskier compared to firms with lower ratios. They also point out that small stocks may be more sensitive to changes in the business conditions and are therefore riskier compared to bigger stocks. Significant coefficients for the SMB and HML factors may indicate that the size or the book-to-market ratios are good proxies for the riskiness of our portfolios (Fama and French, 1992).

6. Results and Analysis

In the following sections we will present our results from the tests on our data and analyze the outcomes. The first subsection will focus on the results from our different tests and regressions, presented in the figures and tables below. In the following section our results will be analyzed based on performance, risk and firm characteristics, to contribute in answering to the purpose of our thesis.

6.1. Results

6.1.1. Indexed Returns

In order to evaluate whether the equal portfolio performs better than the unequal portfolio, we start by comparing the returns of the portfolios during our defined time period March 1st, 2011 to August 31st, 2016. For comparison, the portfolio returns are indexed and plotted against the SIXRX.

Figure 1: Indexed portfolio returns – equally weighted portfolios
Illustration of the indexed monthly returns of the equally weighted equal portfolio and the equally weighted unequal portfolio in relation to the monthly return on the SIXRX as the market index, from March 2011 until August 2016.

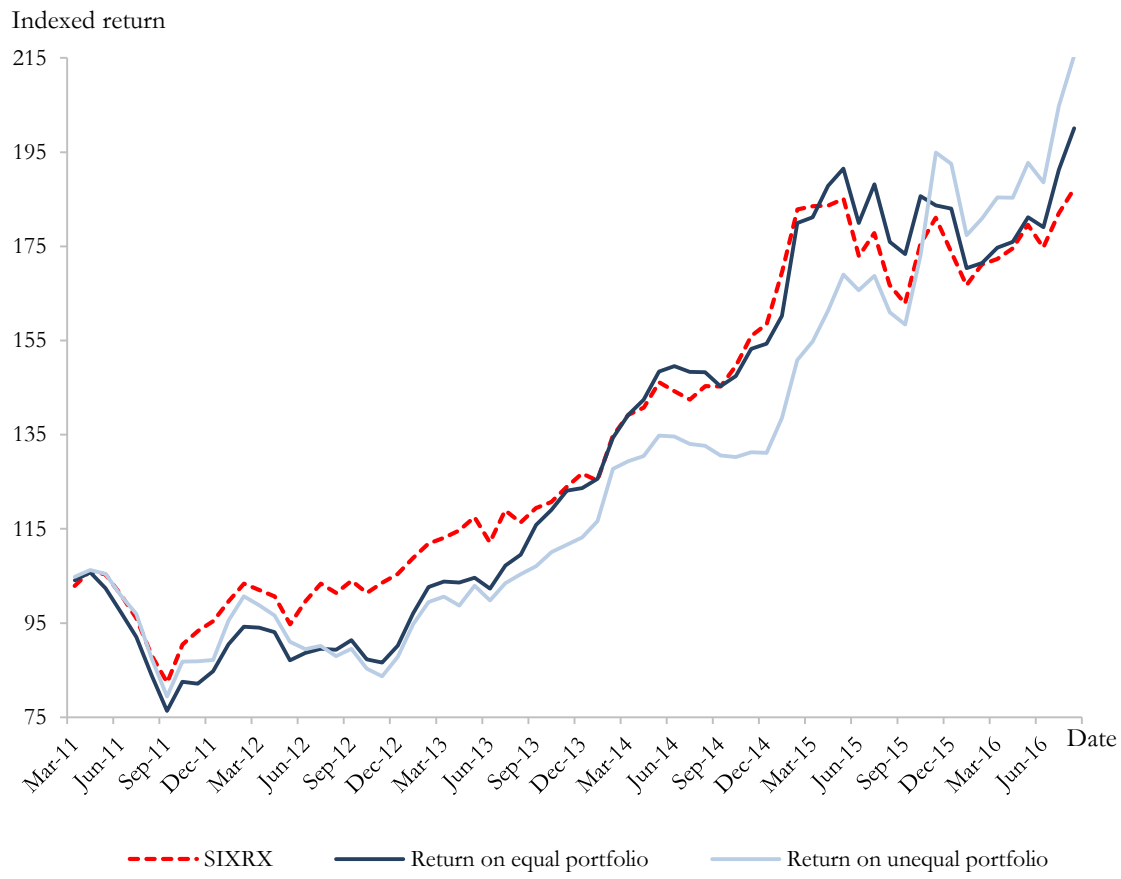
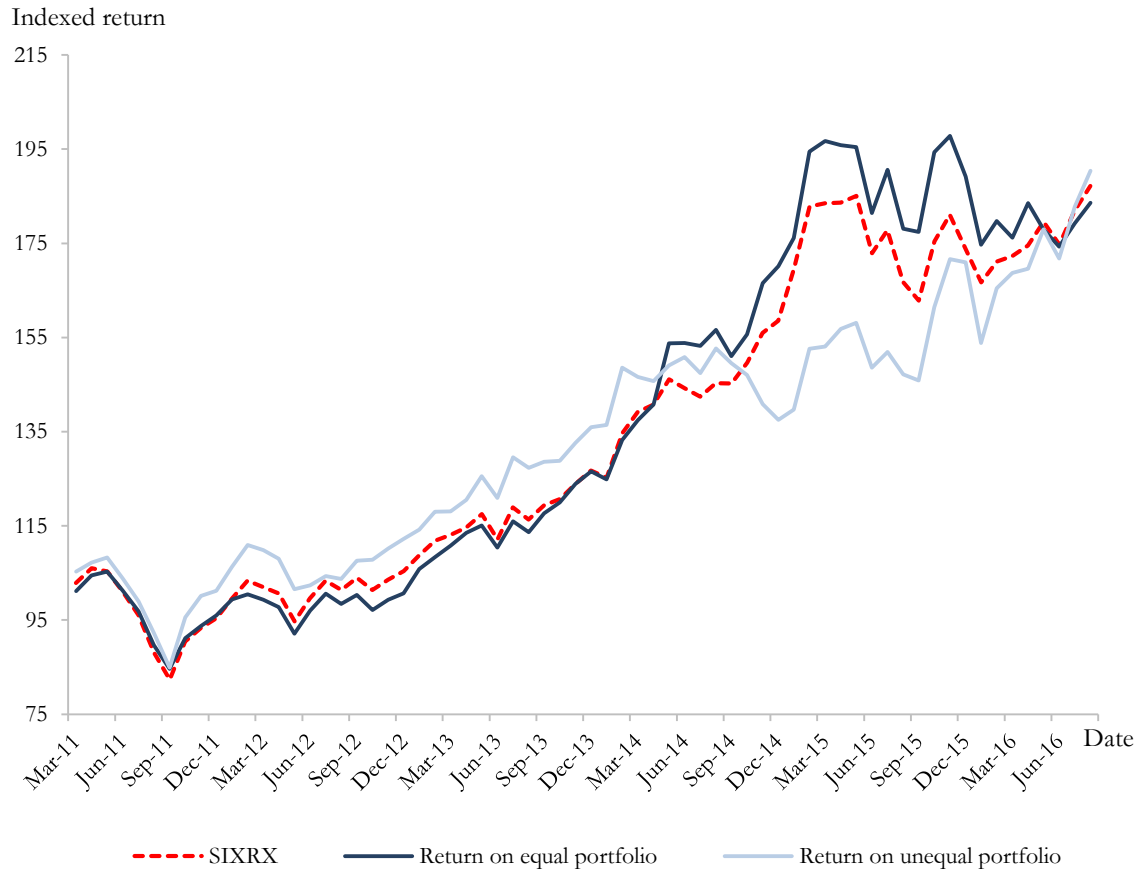


Figure 1 shows the indexed returns of the equally weighted portfolios compared to the market. We can see that returns of the equal portfolio are above the returns of the unequal portfolio during the majority of time. During the past two years, the equal portfolio has been above or in line with the market return. Looking at the whole time period we can see that the return from the equal portfolio has increased by 100% while the return from the unequal portfolio has increased by 116% during the same period. This is compared to the market, yielding a return of 87%. Both portfolios are performing better than the market, even though the unequal portfolio is performing slightly better than the equal one. Another interesting pattern shown in the figure is the fact that the equal portfolio is following the market index more closely compared to the unequal portfolio, especially during the past three years.

Figure 2: Indexed portfolio returns – value weighted portfolios

Illustration of the indexed monthly returns of the value weighted equal portfolio and the value weighted unequal portfolio in relation to the monthly return on the SIXRX as the market index, from March 2011 until August 2016.



In the same way as in the previous figure, portfolio returns are plotted against SIXRX with the difference that the portfolios are value weighted in figure 2. The figure shows that for the past three years, the equal portfolio has yielded higher returns compared to both the market index and

the unequal portfolio. For the equal portfolio this is equivalent to an increase of 62% during the time period August 2013 – August 2016. The returns of the unequal portfolio increased by 50% during the same time period, while the market return increased by 61%. Hence we can conclude that during the most recent years a value weighted portfolio of equal companies has outperformed not only the market but also the value weighted unequal portfolio. Looking at the years prior to 2014, the unequal portfolio has had a higher return than the equal portfolio, though the difference in returns is not large. Both portfolios are in line with the market return during this period, but as we could see in the previous figure the equal portfolio follows the market index more closely; a pattern that is even clearer in this figure. In total, the market, the equal portfolio and the unequal portfolio returns have increased by 87%, 84% and 90% respectively during the whole time period.

6.1.2. Sharpe Ratios

To further analyze returns including risk, we present monthly average and median Sharpe ratios of our portfolios in table 3.

Table 3: Sharpe ratios

Monthly average and median Sharpe ratios for the equally weighted equal and unequal portfolio and the value weighted equal and unequal portfolio.

		Average	Median
Equally weighted	Equal portfolio	0.31	0.39
	Unequal portfolio	0.28	0.22
Value weighted	Equal portfolio	0.37	0.64
	Unequal portfolio	0.32	0.23

66 observations per portfolio, March 2011 – August 2016.

The Sharpe ratios are calculated on a monthly basis for the equal and the unequal portfolio respectively for our defined time period March 1st, 2011 to August 31st, 2016 (see table 10 and 11 in appendix for monthly Sharpe ratios). The outcome Sharpe ratios show that the equal portfolio generates a higher average Sharpe ratio both for the value weighted portfolio and for the equally weighted portfolio. The same is true for the median where the equal portfolio yields higher values in both cases. This suggests that the return of the equal portfolio is more rewarding in relation to the risk taken. Next we perform tests and regressions to investigate whether these differences in returns are significant in the data.

6.1.3. T-tests

To further investigate the difference in returns between the equal portfolio and the unequal portfolio we have performed a two-sampled t-test assuming equal variances between the monthly

returns of the equal portfolio and the monthly returns of the unequal portfolio, with the following results.

Table 4: T-tests on monthly returns

Two sample t-tests with equal variances. First t-test performed on the monthly returns of the equally weighted equal portfolio as the equal sample and the monthly returns of the equally weighted unequal portfolio as the unequal sample. Second t-test performed on the monthly returns of the value weighted equal portfolio as the equal sample and the monthly returns of the value weighted unequal portfolio as the unequal sample.

	Mean - Equal portfolio	Mean - Unequal portfolio	Std. Dev. - Equal portfolio	Std. Dev. - Unequal portfolio	t-value	df	p-values		
							diff<0	diff!=0	diff>0
Equally weighted	0.0114	0.0127	0.0419	0.0455	-0.1688	130	0.4331	0.8662	0.5669
Value weighted	0.0101	0.0107	0.0408	0.0431	-0.0887	130	0.4647	0.9294	0.5353

Each test includes 132 observations, 66 observations per sample.

According to the outcome of the tests, we cannot reject the null hypothesis that there is no difference in the mean of the monthly returns between the portfolios. Hence, the differences in mean are not significantly different from zero. This holds for both the equally weighted and the value weighted portfolio. We can also see that the standard deviation is higher for the unequal portfolio compared to the equal portfolio in both cases, though not by a lot, implying more volatile returns of the unequal portfolio.

6.1.4 Regressions

In the coming section we will present the results from the time series regressions on monthly returns, including the results from the single index model and the multifactor model.

6.1.4.1. Equally weighted portfolios

In our first regression, we regress the excess return of the equal portfolio and the unequal portfolio on the excess return of the market. In the second regression, we control for the additional risk factors, the SMB and HML factors, to test if size and relative value are factors that will help explaining the excess return of our portfolios by capturing risk in the market. The portfolios in the first regression table, table 5, are equally weighted.

Table 5: Regressions of equally weighted portfolios

Results from the regressions of the equally weighted equal and unequal portfolio's monthly excess returns on the monthly excess returns of the market index, single index model.
Results from the regressions of the equally weighted equal and unequal portfolio's monthly excess returns on the monthly excess returns of the market index, SMB factor and HML factor, multi factor model.

	Single index model		Multi factor model	
	Equal portfolio	Unequal portfolio	Equal portfolio	Unequal portfolio
Beta	0.972***	0.999***	1.026***	1.116***
	(0.0664)	(0.0767)	(0.0536)	(0.0711)
SMB			0.681***	1.050***
			(0.118)	(0.145)
HML			0.218*	0.0387
			(0.0959)	(0.130)
Alpha	0.00127	0.00245	0.000722	0.000224
	(0.00259)	(0.00335)	(0.00212)	(0.00248)
Observations	66	66	66	66
R^2	0.767	0.672	0.856	0.818
Adjusted R^2	0.764	0.667	0.849	0.809
rmse	0.0213	0.0277	0.0170	0.0210

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
66 observations for each regression, from March 2011 until August 2016.

The outcome of the single index model regression shows that beta is significant with 99% confidence (p< 0.001) for both the equal portfolio and the unequal portfolio. However, it is important to notice that the regression tests $\beta_p = 0$, and since we are expecting $\beta_p = 1$ it's not surprising that the betas are significantly different from zero with 99% confidence. We compare β_e (beta from the equal portfolio) with β_u (beta from the unequal portfolio), expecting $\beta_e < \beta_u$, which is the case in the single index model regression on the equally weighted portfolios. We can also see that the standard error is smaller for the equal portfolio, implying a more precise fit of the model and a better precision of the beta coefficient.

The highly significant values for β_{SMB} show that the portfolio returns have a high exposure towards the SMB risk factor. β_{SMB} captures the risk stemming from the more volatile small companies and contributes in explaining the excess return of the portfolios. Since the results presented in the first regression table is from the equally weighted portfolios it is not surprising to see high values for the SMB factor, since the smaller companies are given a larger share in the equally weighted

portfolio proportional to size. It is equally true for β_{SMB} as for the market beta that the unequal portfolio yields a higher value. In addition, one of β_{HML} is significant, though on a lower significance level. The significant value of β_{HML} is fairly low, indicating a growth portfolio.

Looking at the regression output in terms of alphas, we can see that alphas are insignificant and we can therefore not draw any conclusions regarding the abnormal returns from this model. However, even though the alphas are insignificant, it is interesting to observe that both portfolios generate positive abnormal returns with the unequal portfolio generating a higher abnormal return than the equal portfolio for the single index model. When adding the SMB and HML factors, the equal portfolio generates a higher abnormal return compared to the unequal portfolio. Overall the abnormal returns from the multi factor model are lower when comparing to the single index model since we now capture more of the risk with our added risk factors.

The large R-square statistics, both in excess of 0.8 for the multi factor model, show that the monthly excess returns are well explained by the three factors in the multi factor model. Comparing the R-squared statistics with the regression without the Fama and French factors, we can see that it has increased both for the equal portfolio and for the unequal portfolio. Hence, by adding two more factors we can explain more of the risk in both portfolios.

6.1.4.2. Value weighted portfolios

In the second regression table we present the results of the regressions when portfolios are value weighted.

Table 6: Regressions of value weighted portfolios

Results from the regressions of the value weighted equal and unequal portfolio's monthly excess returns on the monthly excess returns of the market index, single index model.
Results from the regressions of the value weighted equal and unequal portfolio's monthly excess returns on the monthly excess returns of the market index, SMB factor and HML factor, multi factor model.

	Equal portfolio	Unequal portfolio	Equal portfolio	Unequal portfolio
Beta	0.970***	0.950***	0.941***	1.003***
	(0.0515)	(0.0803)	(0.0601)	(0.0833)
SMB			-0.166	0.518**
			(0.108)	(0.159)
HML			0.0901	0.0552
			(0.0922)	(0.125)
Alpha	-0.0000859	0.000636	0.000719	-0.000295
	(0.00200)	(0.00288)	(0.00197)	(0.00266)
Observations	66	66	66	66
R^2	0.836	0.707	0.843	0.749
Adjusted R^2	0.834	0.702	0.835	0.737
rmse	0.0170	0.0243	0.0170	0.0228

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
66 observations for each regression, from March 2011 until August 2016.

In our value weighted regressions for the single index model, we yield two significant market betas with p-values < 0.001 for the single index model. The difference compared to when the portfolios are equally weighted is that the market beta is now lower for the unequal portfolio. Adding the SMB and HML factors, the equal portfolio yields a lower market beta compared to the unequal portfolio. However we only have one other significant beta value except for the two market betas. The unequal portfolio has a significant value of β_{SMB} with p-value < 0.01. Compared to the previous regressions when the portfolios are equally weighted, this value is lower. This difference is reasonable since the smaller companies have a higher share in the equally weighted portfolio compared to the value weighted portfolio. Hence the portfolios have a higher exposure to the SMB factor in the equally weighted portfolios.

The alphas are insignificant both in the single index model regression and the multi factor model regression, and the results are mixed. In the single index model the equal portfolio yields a negative alpha while in the multi factor model the unequal portfolio yields a negative alpha.

6.2.4. Controlling for Yearly Fixed Effects

So far the alphas of our regressions have been insignificant without any consistent output pattern. In the next step want to look at the effects on annual abnormal returns when adding control variables to control for yearly fixed effects.

To control for yearly fixed effects we run the multi factor model regression with added year dummies. When controlling for yearly fixed effects, we obtain six different intercepts, one for each year, instead of one for the whole time period as with previous regressions. Once again, all alphas are insignificant and we cannot draw any certain conclusions (see complete regression output in table 12 and table 13 found in the appendix). However, we do want to present the yearly abnormal returns in order to investigate whether the patterns we can see in figures 1 and 2 can be explained. The yearly abnormal returns are calculated using the following formula:

$$(1 + \alpha_p)^{12} - 1$$

Table 7: Implied annual abnormal returns from regression with yearly fixed effects

Monthly alphas and implied yearly abnormal returns from the regressions of equally and value weighted equal and unequal portfolios' monthly excess returns on the monthly excess returns of the market index, SMB factor and HML factor, when controlling for yearly fixed effects.

Monthly abnormal return		**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Equally weighted	**Equal portfolio**	-0.17	-0.27	0.75	0.29	0.51	-0.12
	Unequal portfolio	0.29	-0.73	-0.01	-0.48	1.80	-0.05
Value weighted	**Equal portfolio**	1.05	0.59	1.50	1.86	1.62	-1.08
	Unequal portfolio	1.19	-0.21	-0.54	-1.86	0.53	0.19
Implied yearly abnormal return		**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Equally weighted	**Equal portfolio**	-2.07	-3.15	9.34	3.55	6.27	-1.45
	Unequal portfolio	3.59	-8.42	-0.09	-5.63	23.87	-0.65
Value weighted	**Equal portfolio**	13.35	7.33	19.56	24.75	21.27	-12.22
	Unequal portfolio	15.25	-2.54	-6.27	-20.17	6.49	2.29

All measures in percent, 66 observations per regression.

In the equally weighted portfolios we cannot see a clear pattern in annual abnormal returns between the equal and unequal portfolios which is consistent with figure 1. However, looking at the value weighted equal portfolio, it generates positive annual abnormal returns during 2011-2015, with the highest abnormal returns from 2013-2015. The yearly alphas for the equal portfolio are higher than for the unequal portfolio. This outcome corresponds well with figure 2. Though these results are interesting, the alphas are insignificant.

6.2. Analysis

In the coming section the results will be analyzed. This will be carried out in accordance with our stated research question and hence includes the subsections Performance and Risk, which will be analyzed from an SRI perspective. When presenting our results we have also been able to find patterns related to differences in firm characteristics between equal and unequal companies. We analyze these differences in the last subsection 6.2.3.

6.2.1. Performance

We start by comparing performance by plotting indexed returns. From figure 2 we can see that using a trading strategy where equal companies are value weighted in the portfolio can yield positive returns, outperforming the market and the value weighted unequal portfolio. Based on the Sharpe ratios the equal portfolio should be more optimal for an investor compared to the unequal portfolio, since it is more rewarding in terms of returns gained by the investor for the risk taken. Our first performance tests show that the equal portfolio seems to perform better in terms of raw returns and risk-reward ratio. Hence, it could be of value to investors to consider gender equality when investing, though this is not statistically reliable.

Even though we could see differences in figure 1 and figure 2 we find no significant differences in the returns of the portfolios when t-testing the monthly returns. We are not able to conclude on any significant differences in performance from the regression results where we measure performance in terms of abnormal returns. The statistical power of the tests is too low since we do not yield significant alphas (see continued discussion in section 7.2.). One way to interpret this result is that we will not earn higher returns by investing in the equal companies. On the other hand, it will not infer a higher cost to do so. This means that for an investor, with the objective to maximize profit, the investor should be indifferent between investing in the equal or the unequal portfolio. Hence, the gender composition of the board or management is not vital when it comes to the effect it has on firm performance. In the previous research, O'Reilly, and Main (2012) suggest that appointments of women to the boards are generally not done for profit-seeking motives but rather normative motives. Our study shows that more women in board and management does not necessarily yield higher returns. Hence, appointing women for profit-seeking matters may not produce the desired effect. On the other hand, there should be no difference in appointing a man for this reason. Rather, higher returns are generated by qualified personnel making quality decisions.

Investors are usually not only concerned with maximizing profit. Another goal can be to fulfill social and moral goals. Investing in the equal portfolio could hence be a good strategy for a socially

responsible investor. Even though there is no difference in returns, both portfolios keep up with, or do better than, the market during our studied time period. For a socially responsible investor who wants to fulfill social goals while investing this conclusion is valuable. According to our results an investor can combine social consciousness with financial goals and receive the same output as if not making a social responsible investment investing in the unequal portfolio. Furthermore, the socially responsible choice comes with lower risk, as we will analyze in the next section.

6.2.2. Risk

The first risk indicator of our portfolios is the standard deviation from the t-test. The t-tests show that the standard deviation is higher for the unequal portfolio compared to the equal portfolio, confirming the findings by Adams and Ferreira (2004) who state that firms with fewer women on their board of directors face more variability in their stock returns.

Our main indicator of risk is beta. From the single index model we yield four market betas, two for the equal portfolio and two for the unequal portfolio. Comparing the betas from the equally weighted portfolios show $\beta_e < \beta_u$implying the unequal portfolio to be riskier compared to the equal portfolio. When value weighting we get the opposite result, $\beta_e > \beta_u$. The results from the single index model regressions give mixed results and by adding the Fama and French factors we have been able to draw a better picture of the riskiness of our portfolios and the sources of systematic risk.

β_{SMB} is significant for all regressions except for the multifactor regression of the equal, value weighted portfolio. $\beta_{e,SMB} < \beta_{u,SMB}$ for the equally weighted and the value weighted portfolios, which is why the unequal portfolio has a higher risk loading on the size factor. Since smaller companies are riskier compared to larger companies a higher loading on the size factor implies a bigger fraction of small companies in the portfolio and hence a riskier portfolio. The equal portfolio has a significant value for the β_{HML} in the equally weighted portfolio. The significant value of β_{HML} for the equal portfolio is fairly low, indicating a portfolio consisting of a large fraction of growth stocks. From this we can conclude that the size of the companies in the portfolios is a good factor in explaining the risk in the portfolios. The unequal portfolio is riskier since it includes a larger fraction of small companies compared to the equal portfolio which got a lower risk loading on the size factor. Hence, it is less risky with a larger fraction of large cap companies. Since only one of the HML factor loadings were significant we cannot compare differences between the equal and unequal portfolio in terms of value and growth stocks. We know however that a portfolio consisting of mostly growth stocks is less risky than a portfolio consisting of mostly value stocks.

The significant β_{HML} for the equal portfolio indicates a portfolio consisting mostly of growth stocks and is hence less risky.

The yielded betas from the single index model and the multifactor model show that most beta values are significantly lower for the equal portfolio compared to the unequal portfolio. This supports findings in previous literature and contributes in answering our research question that equal companies are less risky compared to unequal companies. Previous research shows that the differences in characteristics of men and women affect their decision making and risk taking in the company. Our results show lower betas for the equal portfolio implying that if women are more risk averse, having more women on decision making positions can lower the risk of the overall firm. This is advantageous for an SRI investor since the risk to reward ratio is higher. To conclude this we have to assume that individual levels of risk taking can affect the risk level of the whole corporation in the sense that the decisions made are what determine the risk of the company. It can also be interpreted as women being more risk averse and hence choose to work for less risky firms compared to men. From our regression we could find other potential sources of the difference in risk between the portfolios which will be discussed in the next section. The question of isolating the factors of risk will be discussed in the section 7.2.

From an SRI perspective this result means that by making a socially responsible investment decision the investor will not only earn the same return as the unequal portfolio but at the same time do so at a lower risk level. The lower risk level can also be due to social norms in the market, which make morally questionable investments more risky. Hence, the equal portfolio looks more optimal to an investor when combining risk, return and social values.

6.2.3. Firm Characteristics

From our tests in the data we have not only been able to draw conclusions regarding the performance and risk but also important conclusions regarding the firm characteristics of the equal and unequal firms.

When presenting the results of the indexed returns we noted that the equal portfolio followed the market index more closely compared to the unequal portfolio. This pattern got clearer when value weighting the portfolios. This is presumably due to the fact that the equal portfolio consists of a larger share of large companies. The larger companies represent a larger share of the market and hence follow the market index closer compared to the smaller companies. The pattern from figures 1 and 2 was significantly proven when running the multi factor model regressions where we yielded higher β_{SMB} values for the unequal portfolio. From these findings it seems that larger companies

are equal to a larger extent compared to smaller companies which seem to have more men in senior positions. This is in line with the research by Moran and Kotschwar (2016), who found a positive correlation between firm size and the presence of women in corporate leading positions. This could also be because men might choose to work for smaller firms to a greater extent compared to women. Smaller firms are already associated with more risk compared to larger companies. Hence it could be that the unequal portfolio is not only riskier because of the underrepresentation of women but also since the companies in the portfolio are smaller.

7. Discussion and Conclusion

In this section we extend our analysis by examining how it relates to findings in previous research. Following the discussion, we describe limitations to our study in an attempt to identify room for improvement and explain the reason for why some of the regression results came out insignificant. We also suggest areas for continued research, which were outside the scope of this thesis. Finally, our conclusion is presented which summarizes our findings and closes our thesis.

7.1. Discussion

Starting off the discussion by focusing on returns, our t-tests show that there are no differences in returns between equal and unequal companies. This is in line with the conclusion drawn by Francoeur, Labelle and Sinclair-Desgagné (2008) who state that significant excess returns were not identified as a result of more women on corporate boards and/or top management. However, firms with more women create enough value to keep up with "normal" stock market returns (Francoeur, Labelle and Sinclair-Desgagné, 2008). Both the t-tests and figures 1 and 2 support this and show that even though the mean return of the equal portfolio is not higher than that of the unequal portfolio, it is on par with the market return and not lower than the return of the unequal portfolio. With two portfolios yielding similar returns, with the difference that one of them is comprised of equal companies, it may be of interest for an investor to choose the socially responsible alternative. This might not attract all investors, but as we have seen through previous research, SRI is gaining continued attention and is increasingly adopted by institutional investors (Sparkes and Cowton, 2004). If considering gender equality is one way of making a socially responsible investment, then the equal portfolio would be prioritized over the unequal portfolio for a socially responsible investor.

Previous research is ambiguous when it comes to gender equality effects on firm performance. Some studies state that a more balanced gender distribution among corporate leaders is positively associated with firm performance (Erhardt, Werbel and Shrader, 2003) while others claim the effect of gender diversity on firm performance to be negative (Adams and Ferreira, 2009). The indefinite effect of gender diversity on performance is in line with the obtained insignificant alphas from our regressions. The fact that we are unable to draw any certain conclusions in terms of abnormal returns corresponds well to the obscurity of conclusions in previous research.

Though the alphas are insignificant they are intriguing to analyze in order to build up an interesting discussion around performance. There is a noteworthy pattern in the implied yearly abnormal

returns obtained from the regression controlling for yearly fixed effects (see table 7). The equal portfolio yields positive alphas for all observed years except for 2016. Though not significant, it shows that investing in equal companies might be a good strategy for a socially conscious investor who is concerned with gender equality. Similar results with significant output can be found in previous studies (Guerard, 1997 & Kempf and Osthoff, 2007) where it is suggested that socially conscious investments can pay off. We can conclude from the tests and regressions that for an investor it does not cost anything to make a conscious investment decision from a gender equality perspective.

In contrast to the alpha outputs, the regressions yield significant betas in all cases. In five out of six regressions the market betas for the equal portfolio are lower than those for the unequal portfolio. This indicates that the equal portfolio infers less risk compared to the unequal portfolio, even after controlling for size and book-to-market value. This is in line with previous research where a very strong negative relationship between diversity and risk is found (Adams and Ferreira, 2004). Jianakopolos and Bernasek (1998) find that women are more risk averse than men in financial decision making. Our results show that the unequal portfolio is riskier which can be explained by a larger portion of men in decision making positions. If men in senior corporate positions make riskier decisions it affects the risk level of the company. The clear majority of previous research is in line with our findings that women are more risk averse than men (Elsaid and Ursel, 2009 & Bymes, Miller and Schafer, 1999). Once again, we have identified a reason for a socially conscious investor to choose an investment in equal companies. With the equal portfolio and the unequal portfolio generating similar returns, it is safe to say that the return yielded from the equal portfolio comes with lower risk and hence a higher risk-reward ratio. Considering gender equality as a part of SRI, a link can be drawn to previous research, stating that socially questionable investments are associated with higher risk due to social norms among other factors (Hong and Kacperczyk, 2009). Thus, the lower risk level may not only be due to the decisions taken internally by the company but also social norms affecting the company externally.

7.2. Limitations and Continued Research

One objective of this thesis was to investigate whether equal firms infer less risk compared to unequal firms, measured by beta. From our regressions we got significant beta outputs and we could conclude that the equal portfolio is less risky compared to the unequal portfolio. However, we cannot be certain to what extent we have been able to isolate the effect of gender on the risk of the company. As been discussed in the analysis there are other significant factors explaining the

difference in risk of the portfolios and there might be other risk factors that we did not include in our analysis that might have affected the results.

Another objective with this thesis was to investigate whether equal firms perform better than unequal firms in terms of abnormal returns. From our regressions we could not conclude anything in terms of differences in abnormal returns. One possible explanation is the frequency of the data observations in measuring returns. We choose to carry out our study on monthly observations on returns. A weekly or daily return frequency might have enabled us to draw stronger conclusions from the regressions in terms of the alpha outputs.

When using the Allbright list rankings to determine which companies to include in our portfolios, we limit our time span to when these reports have been released; 2011-2016. The limited time span might be another reason why our alpha outputs are insignificant in all regressions. With a longer time period of data and hence more observations our outputs might have been significant, even with a monthly frequency. The insignificant alpha output left us unable to conclude whether investments in equal companies perform better in terms of return compared to investments in unequal companies. However the scope and time limit of this thesis limited the possibility to carry out a more thorough study. This leaves an opportunity for further investigation, which we believe would yield interesting and valuable results.

Another option for further research is to develop the regression model by including more control variables. For example it might have been interesting to include a CEO dummy or sector variables but since our alphas were insignificant in all regressions it would not have contributed to the conclusion by adding more variables in our case. With insignificant alphas in each regression we had no reason to believe that adding more variables would yield a different result or contribute to answering the research question. However, if higher frequency can yield significant output it leaves room for adding more control variables. The sector distribution of companies in the portfolios would also have been interesting to analyze in terms of risk. Since risk varies with sectors, this might have brought more insight into explaining the portfolio risk.

Throughout this thesis, we use the definition of equal based on the annual lists provided by the Allbright Foundation as explained in section 2.3.3. The definition of equal and unequal companies is broader than what is usually studied in previous research since our definition includes women in management positions as well as women in the business line and not only the share of women on

the board. The Allbright Foundation also made the criteria needed to be fulfilled in order for a company to remain on the white list stricter in 2014, which affected our data sample by making it smaller in this year and onwards. The way we have defined equality for the purpose of this thesis, may therefore have affected our outcomes in the regressions. Focusing only on the share of women on boards with a more narrow definition of equality may have yielded different results and perhaps significant alphas.

Another way to further investigate gender equality effects is through a comparison among countries. We limit our study to Sweden; a country that in the eyes of many has come a long way when it comes to equality work. Developing the analysis to include more countries, in different parts of the world and in different stages of development might yield interesting results and insights into the subject of gender equality across the world.

7.3. Conclusion

The initial question that we aimed to answer was whether investments in equal companies enhance performance and infer less risk compared to investments in unequal companies. Judging from articles and reports stating that a higher share of women in boards or across the company can generate higher returns (Avanza, 2016 and McKinsey, 2015), we had reason to believe that investments in equal companies enhance performance by generating higher returns than unequal companies. Much academic research has demonstrated how a larger share of women on corporate boards or top management can increase firm performance, for example by Smith, Smith and Verner (2006). However, the conclusions among previous studies are split and some also claim that there is no significant impact on firm performance due to gender diversity, for example the authors Randøy, Thomsen and Oxelheim (2006). The majority of studies suggest women to be more risk averse than men as in the study by Eckel and Grossman (2008). There is also a consensus among SRI research that it is gumptious to consider social factors when investing (Sparkes and Cowton, 2004 and Guerard, 1997).

Combining these three areas of previous research, performance, risk and SRI, we were able to analyze and compare portfolios constructed based on company equality rankings. In line with previous research, we found the equal portfolio to infer less risk compared to the unequal portfolio. In terms of performance, we were unable to draw certain conclusions regarding any potential enhanced effect as a result of investments in equal companies. However, we can conclude that for investors who are concerned with gender equality and investing in a socially responsible way by choosing the equal alternative, it does not infer a higher cost compared to investing in unequal

companies and the risk is lower. The lower risk level may be due to the actual composition of equal companies with a higher share of women but also the size of the companies in the portfolio, which is larger.

We believe our results can provide insight into how gender diversity has an effect on corporate outcomes as documented in studies such as Randøy, Thomsen and Oxelheim (2006), by introducing an investor perspective on gender diversity. Our study goes beyond looking at the effects of gender diversity on a firm level and examines actual investments in portfolios that differentiate from each other due to gender composition. The equal portfolio is less risky than the unequal portfolio and the returns of both portfolios keep up with market returns. Hence an investor will receive the same output for less risk by making an informed investment decision.

8. References

Adams, R. & Ferreira, D. 2004. "Gender diversity in the boardroom". *European Corporate Governance Institute, Finance Working paper*, 57, 30.

Adams, R. & Ferreira, D. 2009. "Women in the Boardroom and Their Impact on Governance and Performance". *Journal of Financial Economics*, vol. 94, issue 2, pp. 291–309.

Adams, R. & Funk, P. 2012. "Beyond the Glass Ceiling: Does Gender Matter?". *Management Science,* vol. 58, issue 2, pp. 219-235.

Ahern, K. & Dittmar, A. 2012. "The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation". *The Quarterly Journal of Economics*, vol. 127, issue 1, pp. 137–197.

Allbright (2012). Bästa och Sämsta Bolagen för Kvinnor. Februari 2012. 2016-09-05. https://static1.squarespace.com/static/5501a836e4b0472e6124f984/t/5632501ae4b000b8ae3b07ba/1446137882310/allbrightrapporten+2012.pdf

Allbright (2013). Två Steg Framåt, Ett Steg Tillbaka. Februari 2013. 2016-09-05. https://static1.squarespace.com/static/5501a836e4b0472e6124f984/t/56324fc3e4b02e7cd053a166/1446137795239/AllBrightrapporten+2013.pdf

Allbright (2014). Ny Norm – En Kvinna i Ledningen. Mars 2014. 2016-09-05. https://static1.squarespace.com/static/5501a836e4b0472e6124f984/t/56324f7ae4b07aacece1338e/1446137722589/AllBrightrapporten+2014.pdf

Allbright (2015). Färdigbantat: Dags för Kompetens. Mars 2015. 2016-09-05. https://static1.squarespace.com/static/5501a836e4b0472e6124f984/t/56324eabe4b0eecc28188ad4/1446137515497/AllBrightrapporten-mars2015.pdf

Allbright (2016). Var Femte Ledare Nu Kvinna. Mars 2016. 2016-09-05. https://static1.squarespace.com/static/5501a836e4b0472e6124f984/t/56dd818c59827e888a9da8e1/1457357199239/AllBrightrapporten2016.pdf

Avanza. 2016. "Jämställda aktier har haft dubbelt så hög avkastning som börsen". 2016-09-01. http://blogg.avanza.se/avanza/jamstallda-aktier-har-haft-dubbelt-sa-hog-avkastning-som-borsen/.

Balabanis, G., Philips, H. & Lyall, J. 1998. "Corporate social responsibility and economic performance in the top British companies: are they linked?". *European Business Review*, vol. 98, issue 1, pp.25-44.

Bodie, Z., Kane, A. & Marcus, A. 2011. Investments, 7th ed, McGraw-Hill.

Bymes, J., Miller D. & Schafer W. 1999. "Gender Differences in Risk Taking: A Meta Analysis". *Psycological Bulletin,* vol. 125, no. 3, pp. 367-383.

Carter, D., Simkins, B. & Simpson, W. 2003. "Corporate Governance, Board Diversity, and Firm Value". *Financial Review,* vol. 38, issue 1, pp. 33–53

Catalyst. 2007. "The bottom line: Corporate performance and women's representation on boards". 2007-10-15. http://www.catalyst.org/knowledge/bottom-line-corporate-performance-and-womens-representation-boards

Chand, M. 2006. "The Relationship between Corporate Social Performance and Corporate Financial Performance: Industry Type as a Boundary Condition". *The Business Review*, vol. 5, issue 1, pp. 240-245.

Credit Suisse. 2012. "Gender diversity and corporate performance". August 2012. http://www.calstrs.com/sites/main/files/file-attachments/csri_gender_diversity_and_corporate_performance.pdf

Croson, R. & Gneezy, U. 2009. "Gender differences in preferences". *Journal of Economic Literature*, vol. 47, issue 2, pp. 448–474.

Diltz, D. 1995. "The private cost of socially responsible investing". *Applied Financial Economics*, vol. 5, issue 2, pp. 69-77.

Eckel, C & Grossman, P. 2008. "Men, women, and risk aversion: Experimental evidence". *Handbook of Experimental Economic Results*, vol. 1, pp. 1061–1073.

Elsaid, E. & Ursel, N. 2009. "CEO Succession, Demographics and Risk Taking". *ASAC*, vol. 30, no. 1.

Erhardt, N., Werbel, J. & Shrader, C. 2003. "Board of Director Diversity and Firm Financial Performance". *Corporate Governance: An International Review*, vol. 11, issue 2, pp. 102–11.

European Commission. 2012. Women on boards—factsheet 1.

http://ec.europa.eu/justice/gender-equality/files/womenonboards/factsheet-general-1_en.pdf

Eurosif. 2016. "European SRI study 2016". 2016-11-02. http://www.eurosif.org/wp-content/uploads/2016/11/SRI-study-2016-HR.pdf

Fama, E. & French, K. 1992. "The Cross-Section of Expected Stock Returns". *The Journal of Finance,* vol. 47, issue 2, pp. 427-465.

Francoeur, C., Labelle, R. & Sinclair-Desgagné, B. 2008. "Gender Diversity in Corporate Governance and Top Management". *Journal of Business Ethics*, vol. 81, issue 1, pp. 83-95.

French, K. http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/. 2016-11-10

Guerard Jr, J. 1997. "Is there a cost to being socially responsible in investing?". *Journal of Investing*, vol. 6, issue 2, pp. 11-18.

Hill, R., Ainscough, T., Shank, T. & Manullang, D. 2007. "Corporate Social Responsibility and Socially Responsible Investing: A Global Perspective". *Journal of Business Ethics*, vol. 70, issue 2, pp. 165-174.

Hong, H. & Kacperczyk, M. 2009. "The price of sin: The effects of social norms on markets". *Journal of Financial Economics*, vol. 93, issue 1, pp. 15-36.

Jianakoplos, N. & Bernasek, A. 1998. "Are Women More Risk Averse?", *Economic Inquiry*, vol. 36, issue 4, pp. 620–630.

Kempf, A. & Osthoff, P. 2007. "The Effect of Socially Responsible Investing on Portfolio Performance". *European Financial Management*, vol. 13, issue 5, pp. 908–922.

Markowitz, H. 1952. Portfolio Selection. *Journal of Finance*, vol. 7, issue 1, pp. 77-91.

Matsa, D. & Miller, A. 2013. "A female style in corporate leadership? Evidence from quotas". *American Economic Journal: Applied Economics*, vol. 5, issue 3, pp. 136–169.

McKinsey and Company, Inc. 2007. "Women Matter- Gender Diversity, a Corporate Performance Driver". 2016-10-15. http://www.mckinsey.com/features/women_matter

McKinsey and Company, Inc. 2015. "Diversity matters". 2016-10-15. http://www.mckinsey.com/business-functions/organization/our-insights/why-diversity-matters

Lintner, J. 1965. "The Valuation of Risk Assets and the Selection of Risky Investments in Stock

Portfolios and Capital Budgets". *Review of Economics and Statistics*, vol. 47, no. 1, pp. 13-37.

Lougee, B. & Wallace, J. 2008. "The Corporate Social Responsibility (CSR) Trend". *Journal of Applied Corporate Finance*, vol. 20, issue 1, pp. 96-108.

Nasdaq. 2016. "Regelverk för emittenter". 2016-10-25. http://business.nasdaq.com/Docs/Nasdaq-Stockholm-Rule-Book-for-Issuers_SV.pdf

Noland, M., Moran, T. & Kotschwar, B. 2016. "Is Gender Diversity Profitbale? Evidence From a Global Survey". *Peterson Institute for International Economics Working Paper*, no. 16-3.

O'Reilly, C. & Main, B. 2012. "Women in the Boardroom: Symbols or Substance?" *Stanford Graduate School of Business Research Paper,* no. 117.

Randøy, T., Thomsen, S. & Oxelheim, L. 2006. "A Nordic Perspective on Corporate Board Diversity". *Age, 390* (0.5428).

Sapienza, P., Zingales, L. & Maestripieri, D. 2009. "Gender differences in financial risk aversion and career choices are affected by testosterone". *Proceedings of the National Academy of Sciences*, vol. 106, no. 36, pp. 15,268-15,273.

Smith, N., Smith, V. & Verner, M. 2006. "Do women in top management affect firm performance? A panel study of 2,500 Danish firms". *International Journal of Productivity and Performance Management*, vol. 55, issue 7, pp. 569-593.

Sparkes, R. & Cowton, C. 2004. "The Maturing of Socially Responsible Investment: A Review of the Developing Link with Corporate Social Responsibility". *Journal of Business Ethics,* vol. 45, issue 1, p. 45-57.

Thomson Reuters Datastream.

9. Appendix

Table 8: Monthly portfolio returns – equally weighted portfolios

Portfolio returns calculated on a monthly basis for the equally weighted equal and unequal portfolio.

Month	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
January			6.74	9.66	7.58	7.90	1.59	3.06	3.83	5.68	-6.91	-7.87
February			4.16	5.39	5.72	4.96	6.92	9.52	12.33	8.88	0.64	1.98
March	4.05	4.83	-0.23	-1.90	1.14	1.12	3.63	1.28	0.67	2.61	1.90	2.47
April	1.64	1.33	-1.05	-2.17	-0.19	-1.85	2.28	0.80	3.67	4.20	0.68	-0.03
May	-3.23	-0.71	-6.37	-5.84	0.99	4.23	4.21	3.33	1.95	4.77	2.99	4.02
June	-4.95	-4.38	1.78	-1.65	-2.22	-2.99	0.77	-0.12	-6.04	-1.98	-1.18	-2.17
July	-5.35	-3.89	0.95	0.74	4.76	3.62	-0.80	-1.16	4.58	1.85	6.83	8.58
August	-8.87	-9.77	-0.17	-2.43	2.18	1.84	-0.02	-0.30	-6.50	-4.58	4.60	5.27
September	-8.99	-9.18	2.25	1.80	5.80	1.62	-2.03	-1.56	-1.47	-1.62		
October	8.05	9.27	-4.45	-4.75	2.74	2.85	1.47	-0.24	7.10	9.29		
November	-0.49	0.13	-0.79	-1.91	3.42	1.40	3.93	0.75	-1.08	12.62		
December	3.25	0.26	4.19	4.99	0.46	1.41	0.71	-0.09	-0.35	-1.22		
Average	-1.49	-1.21	0.58	0.16	2.70	2.18	1.89	1.27	1.56	3.37	1.19	1.53

All numbers in percent.

Table 9: Monthly portfolio returns – value weighted portfolios

Portfolio returns calculated on a monthly basis for the value weighted equal and unequal portfolio.

	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
January			3.53	5.09	5.14	1.78	-1.31	0.31	3.52	1.57	-7.62	-10.02
February			1.09	4.33	2.35	3.34	6.67	8.92	10.44	9.26	2.85	7.57
March	1.14	5.31	-1.16	-0.98	2.26	0.07	3.17	-1.32	1.14	0.30	-1.97	1.98
April	3.29	1.81	-1.55	-1.65	2.47	2.05	2.40	-0.57	-0.44	2.45	4.17	0.51
May	0.77	1.01	-5.77	-5.99	1.34	4.18	9.25	2.28	-0.19	0.82	-3.02	4.94
June	-3.83	-4.16	5.31	0.79	-4.03	-3.66	0.02	1.15	-7.19	-6.01	-2.07	-3.45
July	-4.30	-4.65	3.69	1.92	5.03	7.10	-0.38	-2.24	5.08	2.22	2.85	6.38
August	-7.44	-6.79	-2.12	-0.60	-2.02	-1.72	2.22	3.55	-6.59	-3.11	2.44	4.19
September	-5.66	-7.93	1.92	3.78	3.52	0.99	-3.56	-2.05	-0.37	-0.90		
October	7.72	12.53	-3.19	0.16	2.01	0.16	3.07	-1.70	9.53	10.67		
November	2.83	4.78	2.22	2.21	3.24	2.96	6.99	-4.21	1.78	6.35		
December	2.43	1.05	1.40	1.82	2.16	2.56	2.13	-2.35	-4.37	-0.42		
Average	-0.30	0.30	0.45	0.91	1.96	1.65	2.56	0.15	1.03	1.93	-0.30	1.51

All numbers in percent.

Table 10: Monthly Sharpe ratios – equally weighted portfolios

Monthly Sharpe ratios calculated on a monthly basis for the equally weighted equal and unequal portfolio.

Month	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
January			2.44	3.42	3.24	2.85	0.39	1.15	1.79	2.16	-2.50	-2.29
February			0.95	1.33	1.91	1.59	2.59	3.75	5.26	3.54	0.41	0.66
March	1.18	1.37	-0.80	-1.46	0.07	0.06	1.46	0.24	0.38	1.02	1.47	1.49
April	-0.05	-0.20	-1.11	-1.39	-0.53	-1.28	0.85	0.03	1.93	1.99	0.75	0.24
May	-2.55	-1.13	-3.23	-2.90	0.01	1.47	1.89	1.36	1.02	1.80	2.14	1.47
June	-3.04	-2.68	0.12	-1.30	-1.51	-1.72	0.03	-0.44	-2.45	-0.68	-0.24	-0.60
July	-3.52	-2.14	-0.17	-0.24	1.92	1.29	-0.66	-0.70	2.14	1.06	3.02	4.30
August	-2.79	-2.93	-0.69	-1.89	0.59	0.44	-0.14	-0.27	-2.25	-1.51	3.26	2.98
September	-3.46	-3.69	0.46	0.26	2.28	0.34	-1.30	-0.78	-0.44	-0.48		
October	2.22	2.47	-2.55	-2.87	0.78	0.78	0.47	-0.14	2.93	3.43		
November	-0.83	-0.61	-0.92	-1.18	1.15	0.21	2.13	0.33	-0.32	3.93		
December	0.67	-0.64	1.78	1.75	-0.21	0.29	0.34	-0.08	0.04	-0.32		
Average	-1.22	-1.02	-0.31	-0.54	0.81	0.53	0.67	0.37	0.83	1.33	1.04	1.03
Median	-1.69	-0.89	-0.43	-1.24	0.69	0.39	0.43	-0.03	0.70	1.43	1.11	1.06

Table 11: Monthly Sharpe ratios – value weighted portfolios

Monthly Sharpe ratios calculated on a monthly basis for the value weighted equal and unequal portfolio.

Month	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
January			2.44	3.42	3.24	2.85	0.39	1.15	1.79	2.16	-2.50	-2.29
February			0.95	1.33	1.91	1.59	2.59	3.75	5.26	3.54	0.41	0.66
March	1.18	1.37	-0.80	-1.46	0.07	0.06	1.46	0.24	0.38	1.02	1.47	1.49
April	-0.05	-0.20	-1.11	-1.39	-0.53	-1.28	0.85	0.03	1.93	1.99	0.75	0.24
May	-2.55	-1.13	-3.23	-2.90	0.01	1.47	1.89	1.36	1.02	1.80	2.14	1.47
June	-3.04	-2.68	0.12	-1.30	-1.51	-1.72	0.03	-0.44	-2.45	-0.68	-0.24	-0.60
July	-3.52	-2.14	-0.17	-0.24	1.92	1.29	-0.66	-0.70	2.14	1.06	3.02	4.30
August	-2.79	-2.93	-0.69	-1.89	0.59	0.44	-0.14	-0.27	-2.25	-1.51	3.26	2.98
September	-3.46	-3.69	0.46	0.26	2.28	0.34	-1.30	-0.78	-0.44	-0.48		
October	2.22	2.47	-2.55	-2.87	0.78	0.78	0.47	-0.14	2.93	3.43		
November	-0.83	-0.61	-0.92	-1.18	1.15	0.21	2.13	0.33	-0.32	3.93		
December	0.67	-0.64	1.78	1.75	-0.21	0.29	0.34	-0.08	0.04	-0.32		
Average	-1.22	-1.02	-0.31	-0.54	0.81	0.53	0.67	0.37	0.83	1.33	1.04	1.03
Median	-1.69	-0.89	-0.43	-1.24	0.69	0.39	0.43	-0.03	0.70	1.43	1.11	1.06

Table 12: Regression of equally weighted portfolios controlling for yearly fixed effects

Results from the regressions of the equally weighted equal and unequal portfolio's monthly excess returns on the monthly excess returns of the market index, SMB factor and HML factor, controlling for yearly fixed effects using year dummies.

		Equal portfolio	Unequal portfolio
Beta		1.004***	1.082***
		(0.0611)	(0.0742)
SMB		0.632***	0.957***
		(0.130)	(0.166)
HML		0.207*	0.140
		(0.0959)	(0.115)
Alpha	2011	-0.00174	0.00294
		(0.0100)	(0.0103)
Alpha	2012	-0.00266	-0.00730
		(0.00832)	(0.00940)
Alpha	2013	0.00747	-0.0000732
		(0.00927)	(0.00904)
Alpha	2014	0.00291	-0.00482
		(0.00852)	(0.00960)
Alpha	2015	0.00508	0.0180
		(0.00979)	(0.0112)
Alpha	2016	-0.00122	-0.000543
		(0.00767)	(0.00797)
Observations		66	66
R^2		0.863	0.846
Adjusted R^2		0.844	0.824
rmse		0.0173	0.0201

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

66 observations for each regression, from March 2011 until August 2016.

Table 13: Regression of value weighted portfolios controlling for yearly fixed effects

Results from the regressions of the value weighted equal and unequal portfolio's monthly excess returns on the monthly excess returns of the market index, SMB factor and HML factor, controlling for yearly fixed effects using year dummies.

	Equal portfolio	Unequal portfolio
Beta	0.923***	1.043***
	(0.0609)	(0.0844)
SMB	-0.182	0.539**
	(0.120)	(0.165)
HML	0.121	0.143
	(0.0987)	(0.112)
Alpha 2011	0.0105	0.0119
	(0.0105)	(0.0130)
Alpha 2012	0.00591	-0.00214
	(0.00927)	(0.0108)
Alpha 2013	0.0150	-0.00538
	(0.00926)	(0.00990)
Alpha 2014	0.0186	-0.0186
	(0.0110)	(0.0133)
Alpha 2015	0.0162	0.00525
	(0.0105)	(0.0113)
Alpha 2016	-0.0108	0.00189
	(0.00905)	(0.00991)
Observations	66	66
R^2	0.864	0.792
Adjusted R^2	0.845	0.763
rmse	0.0165	0.0217

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

66 observations for each regression, from March 2011 until August 2016.

Table 14: Portfolio companies

Yearly categorization of portfolio companies. 1 if included in portfolio and 0 otherwise.

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
AAK	1	0	1	0	1	0	0	0	0	0	0	0
ABB Ltd	1	0	1	0	1	0	0	0	0	0	0	0
Acando	1	0	1	0	1	0	0	0	0	0	0	0
ACAP	0	1	0	1	0	1	0	1	0	0	0	0
A-Com	1	0	1	0	1	0	0	0	0	0	0	0
Active Biotech	1	0	1	0	1	0	0	0	0	0	0	0
Addnode	0	1	0	1	0	1	0	1	0	1	0	1
Addtech	1	0	1	0	1	0	0	0	0	0	0	1
Aerocrine	1	0	1	0	1	0	0	0	0	0	0	0
Africa oil	0	0	0	0	0	0	0	0	0	1	0	1
Alfa Laval	1	0	1	0	1	0	0	0	0	0	0	0
Alimak Group	0	0	0	0	0	0	0	0	0	0	0	1
Allenex	1	0	1	0	1	0	1	0	1	0	1	0
Alliance Oil Company	1	0	1	0	1	0	0	0	0	0	0	0
AllTele	0	1	0	1	1	0	0	1	0	0	0	1
Amasten Holding	0	1	0	1	0	1	0	0	0	0	0	0
Anoto Group	1	0	1	0	1	0	0	0	0	1	0	0
Arcam	0	0	0	0	1	0	0	0	0	0	0	1
Arise	0	1	0	1	0	1	0	1	0	1	0	1
Artimplant	1	0	1	0	1	0	0	0	0	0	0	0
Aspiro	0	1	0	1	0	1	0	1	0	1	0	0
ASSA ABLOY	0	1	0	1	1	0	0	0	0	0	0	0
AstraZeneca	1	0	1	0	1	0	0	0	0	0	0	0
Atlas Copco	1	0	1	0	1	0	0	0	0	0	0	0
Atrium Ljungberg	1	0	1	0	1	0	1	0	1	0	1	0
Attendo	0	0	0	0	0	0	0	0	0	0	1	0
Autoliv	0	1	0	1	0	1	0	1	0	0	0	0
Avanza Bank Holding	1	0	1	0	1	0	0	0	0	0	0	0
Avega Group	1	0	1	0	1	0	0	0	0	0	0	0
Axfood	1	0	1	0	1	0	0	0	0	0	0	0
Axis	1	0	1	0	1	0	0	0	0	0	0	0
B&B TOOLS	1	0	1	0	0	1	0	0	0	0	0	0
BE Group	0	1	0	1	0	1	0	1	0	1	0	1
Beijer Alma	0	1	0	1	0	1	0	1	0	1	0	1
Beijer Electronics	1	0	1	0	1	0	0	0	0	0	0	1
Beijer Ref	0	1	0	1	0	1	0	1	0	1	0	1
Bergs Timber	0	1	0	1	0	1	0	1	0	1	0	1
Betsson	0	1	0	1	0	1	0	1	0	0	0	0
Bilia	1	0	1	0	1	0	0	0	0	0	0	0
BillerudKorsnäs	1	0	1	0	1	0	0	0	0	0	0	0
BioGaia	1	0	1	0	1	0	1	0	1	0	1	0
BioInvent International	1	0	1	0	1	0	0	1	0	1	0	0

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
Biotage	0	1	1	0	1	0	0	0	0	0	0	0
Björn Borg	1	0	1	0	1	0	1	0	0	0	1	0
Black Earth Farming	0	1	0	1	0	1	0	1	0	0	0	0
BlackPearl Resources	0	0	0	0	0	0	0	1	0	1	0	1
Boliden	0	1	0	1	1	0	0	0	0	0	0	0
Bong	0	1	0	1	0	1	0	0	0	0	0	0
Boule Diagnostics	1	0	1	0	0	1	0	1	0	1	0	1
Bravida Holding	0	0	0	0	0	0	0	0	0	0	0	1
Brinova Fastigheter	0	1	0	1	0	0	0	0	0	0	0	0
BTS Group	0	1	0	1	0	1	0	1	0	1	0	1
Bulten AB	1	0	1	0	1	0	0	0	0	0	0	0
Bure Equity	0	1	0	1	0	1	0	1	0	1	0	1
Byggmax Group	1	0	1	0	1	0	0	0	0	0	0	0
Castellum	1	0	1	0	1	0	0	0	0	0	0	0
Catena	0	1	0	1	0	1	0	1	0	0	0	0
Cavotec	0	1	0	1	1	0	0	0	0	0	0	0
CellaVision	1	0	1	0	1	0	1	0	0	0	0	0
Cision	0	1	0	1	0	1	1	0	0	0	0	0
Clas Ohlson	1	0	1	0	1	0	0	0	0	0	0	0
Cloetta	1	0	1	0	1	0	0	0	0	0	0	0
CLX Communications	0	0	0	0	0	0	0	0	0	0	0	1
Coastal Contacts	0	0	0	0	1	0	0	0	0	0	0	0
Collector	0	0	0	0	0	0	0	0	0	0	1	0
Concentric	1	0	1	0	0	1	0	1	0	1	0	0
Concordia Maritime	1	0	1	0	1	0	0	0	1	0	1	0
Connecta	1	0	1	0	1	0	0	0	0	0	0	0
Consilium	1	0	1	0	1	0	0	0	0	0	0	0
Corem Property Group	1	0	1	0	1	0	0	0	0	0	1	0
C-RAD	0	0	0	0	0	0	0	0	0	1	0	1
Creades	0	0	0	0	0	0	0	1	0	1	1	0
CTT Systems	1	0	1	0	1	0	0	0	0	0	0	0
Cybercom Group	1	0	1	0	1	0	0	0	0	0	0	0
Dagon	0	1	0	1	0	0	0	0	0	0	0	0
Dedicare	1	0	1	0	1	0	1	0	1	0	1	0
DGC One	0	1	0	1	0	1	0	1	0	1	0	1
Diamyd Medical	1	0	1	0	1	0	0	0	0	0	0	0
Diös Fastigheter	0	1	0	1	0	1	0	0	1	0	0	0
DORO	1	0	1	0	1	0	0	0	0	0	0	0
Duni	0	1	0	1	1	0	0	0	0	0	0	0
Duroc	0	1	0	1	0	1	0	1	1	0	1	0
East Capital Explorer	0	1	1	0	1	0	1	0	0	0	0	0
Elanders	0	1	0	1	0	1	0	0	0	1	0	1
Electra Gruppen	1	0	1	0	1	0	0	0	0	0	0	0
Electrolux	1	0	1	0	1	0	0	0	0	0	0	0

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
Elekta	1	0	1	0	1	0	0	0	0	0	0	0
Elos Medtech	1	0	1	0	1	0	0	0	0	0	1	0
Endomines	0	0	0	0	0	0	0	1	0	1	0	1
Enea	1	0	1	0	1	0	0	0	0	1	0	0
Eniro	1	0	1	0	1	0	0	0	0	0	0	0
EnQuest PLC	0	1	0	1	0	1	0	1	0	1	0	1
Episurf	0	0	0	0	0	0	0	0	1	0	0	0
Ericsson	1	0	1	0	1	0	0	0	0	0	0	0
Etrion	0	1	0	1	1	0	0	1	0	0	0	1
eWork Group	1	0	1	0	1	0	1	0	0	0	0	0
Fabege	1	0	1	0	1	0	0	0	0	0	0	0
Fagerhult	1	0	1	0	1	0	0	0	0	0	0	0
Fast Partner	0	1	0	1	0	1	0	1	0	1	0	1
Fast. Balder	1	0	1	0	1	0	0	0	0	0	0	0
Feelgood Svenska	1	0	1	0	1	0	1	0	1	0	1	0
Fenix Outdoor International	0	1	0	1	0	1	0	1	0	1	0	0
Fingerprint Cards	0	1	0	1	0	1	0	1	0	1	0	1
FormPipe Software	1	0	1	0	1	0	0	1	0	1	0	1
G5 Entertainment	0	0	0	0	0	0	0	0	0	1	0	1
Getinge	0	1	0	1	0	1	0	1	0	1	0	0
Geveko	0	1	0	1	0	1	0	1	0	1	0	0
GHP Specialty Care	1	0	1	0	1	0	1	0	1	0	0	0
Gunnebo	1	0	1	0	1	0	0	0	0	0	0	0
Haldex	0	1	0	1	0	1	0	1	0	0	0	0
Havsfrun Investment	0	1	0	1	0	1	0	1	0	1	0	1
HEBA	1	0	1	0	1	0	0	0	0	0	1	0
Hemfosa Fastigheter	0	0	0	0	0	0	0	0	1	0	0	0
Hemtex	1	0	1	0	1	0	0	0	0	0	0	0
Hennes & Mauritz	1	0	1	0	1	0	0	0	0	0	1	0
Hexagon	0	1	0	1	0	1	0	1	0	1	0	0
Hexatronic Group	0	0	0	0	0	0	0	0	0	0	0	1
HEXPOL	0	1	0	1	1	0	0	0	0	0	0	0
HiQ International	1	0	1	0	1	0	0	0	0	0	0	0
HMS Networks	1	0	1	0	1	0	0	0	0	0	0	0
Holmen	1	0	1	0	1	0	0	0	0	0	0	0
Hufvudstaden	1	0	1	0	1	0	0	0	0	0	0	0
Husqvarna	0	1	0	1	1	0	0	0	0	0	0	0
Höganäs	0	1	0	1	0	1	0	0	0	0	0	0
IAR Systems Group	1	0	1	0	1	0	0	0	0	1	0	0
ICA Gruppen AB	0	1	0	1	0	1	0	0	0	0	0	0
IFS	0	1	0	1	0	1	0	1	0	1	0	1
Image Systems	0	1	0	1	1	0	0	0	0	1	0	1
Immune Pharmaceuticals	0	1	0	1	0	1	0	0	0	0	0	0
Industrivärden	0	1	0	1	0	1	0	1	0	1	0	0

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
Indutrade	0	1	0	1	0	1	0	1	0	1	0	0
Intellecta	1	0	1	0	1	0	1	0	0	0	1	0
Intrum Justitia	0	1	0	1	1	0	0	0	0	0	0	0
Investor	1	0	1	0	1	0	1	0	1	0	1	0
Invisio Communication	0	0	0	0	0	0	0	0	0	0	0	1
ITAB Shop Concept	0	1	0	1	0	1	0	1	0	1	0	1
Jeeves	1	0	1	0	0	0	0	0	0	0	0	0
JM	1	0	1	0	1	0	0	0	0	0	0	0
KABE	0	1	0	1	0	1	0	0	0	0	0	0
KappAhl	1	0	1	0	1	0	1	0	1	0	1	0
Karo Pharma	1	0	1	0	1	0	1	0	0	0	0	0
Karolinska Development	0	1	0	1	0	1	0	1	1	0	0	1
Kinnevik	1	0	1	0	1	0	1	0	0	0	0	0
Klövern	1	0	1	0	1	0	0	0	0	0	0	0
Knowit	1	0	1	0	0	1	0	0	0	0	0	0
Kungsleden	1	0	1	0	1	0	1	0	1	0	1	0
Lagercrantz Group	0	1	0	1	0	1	0	1	0	0	0	1
Lammhults Design Group	0	1	0	1	0	1	0	1	0	1	0	1
Latour	0	1	0	1	0	1	0	1	0	1	0	1
Lindab International	1	0	1	0	0	1	0	1	0	1	0	1
Loomis	0	1	0	1	0	1	0	1	0	1	0	1
Lundbergföretagen	0	1	0	1	0	1	0	1	0	1	0	1
Lundin Mining Corporation	1	0	1	0	1	0	1	0	1	0	0	0
Lundin Petroleum	0	1	1	0	1	0	0	0	0	0	0	0
Luxonen	0	1	0	1	0	1	0	0	0	0	0	0
Malmbergs Elektriska	1	0	1	0	1	0	0	0	0	0	0	0
Meda	0	1	0	1	0	1	0	0	0	1	0	1
Medivir	1	0	1	0	1	0	0	0	0	0	0	0
Mekonomen	1	0	1	0	1	0	0	0	0	0	0	1
Melker Schörling	0	1	0	1	0	1	0	1	0	1	0	1
Metro International	1	0	1	0	0	0	0	0	0	0	0	0
Micro Systemation	0	0	0	0	0	1	0	1	0	1	0	1
Midsona	0	1	0	1	0	1	0	1	0	1	0	1
Midway	1	0	1	0	1	0	1	0	1	0	1	0
Millicom Int. Cellular	0	1	0	1	0	1	0	1	0	0	0	0
Moberg Pharma	1	0	1	0	1	0	0	0	0	0	0	0
Modern Times Group	1	0	1	0	1	0	0	0	0	0	0	0
MQ Holding	1	0	1	0	1	0	1	0	1	0	0	0
MSC Group	0	1	0	1	1	0	0	0	0	0	0	0
MultiQ International	1	0	1	0	1	0	0	0	0	0	0	0
Mycronic	1	0	1	0	0	1	0	0	0	0	0	0
NAXS	0	1	0	1	0	1	0	1	0	1	0	1
NCC	1	0	1	0	1	0	0	0	0	0	0	0
Nederman Holding	1	0	1	0	1	0	0	0	0	0	0	0

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
Net Insight	1	0	1	0	1	0	0	0	0	0	0	0
NetEnt	1	0	1	0	1	0	1	0	1	0	1	0
NeuroVive Pharmaceutical	0	0	0	0	0	0	0	1	0	0	0	0
New Wave	0	1	0	1	0	1	0	1	0	1	0	1
NIBE Industrier	0	1	0	1	0	1	0	1	0	1	0	1
Niscayah Group	0	1	0	1	0	0	0	0	0	0	0	0
Nobia	1	0	1	0	1	0	0	0	0	0	0	0
Nolato	0	1	0	1	0	1	0	1	0	1	0	1
Nordea Bank	1	0	1	0	1	0	0	0	0	0	0	0
Nordic Mines	0	1	0	1	1	0	0	0	0	1	0	0
Nordic Service Partners	1	0	1	0	1	0	0	0	0	1	0	0
Nordnet	1	0	1	0	1	0	0	0	0	0	0	0
NOTE	0	1	0	1	0	1	0	1	0	1	0	1
Novotek	0	1	0	1	0	1	0	1	0	1	0	1
Oasmia Pharmaceutical	1	0	1	0	1	0	0	0	0	0	0	0
Odd Molly	1	0	1	0	1	0	0	0	1	0	1	0
OEM International	0	1	0	1	0	1	0	1	0	1	0	1
Opus Group	0	0	0	0	0	0	0	0	0	0	0	1
Orc Group	1	0	1	0	0	0	0	0	0	0	0	0
Orexo	1	0	1	0	1	0	0	0	0	0	0	1
Oriflame	1	0	1	0	1	0	0	1	0	1	0	0
Ortivus	0	1	0	1	1	0	0	0	0	0	0	1
PA Resources	0	1	0	1	0	1	0	1	0	1	0	0
PartnerTech	0	1	0	1	0	1	0	1	0	1	0	0
Peab	0	1	0	1	1	0	0	0	0	0	0	0
Availo	1	0	1	0	1	0	1	0	0	0	0	0
Platzer Fastigheter	0	0	0	0	0	0	0	0	1	0	1	0
Poolia	1	0	1	0	1	0	0	0	0	0	0	0
Precise Biometrics	0	1	0	1	0	1	0	0	0	1	0	1
Prevas	0	1	0	1	0	1	0	0	0	0	0	0
Pricer	0	1	0	1	0	1	0	1	0	1	0	0
Proact IT Group	1	0	1	0	1	0	0	0	0	0	0	0
Probi	0	1	0	1	1	0	0	0	0	0	0	0
Proffice	1	0	1	0	1	0	1	0	0	0	0	0
ProfilGruppen	1	0	1	0	1	0	0	0	0	0	1	0
PSI Group	0	1	0	1	0	0	0	0	0	0	0	0
Qliro Group	1	0	1	0	1	0	0	0	0	0	0	0
Ratos	1	0	1	0	1	0	0	0	1	0	1	0
RaySearch	0	1	0	1	0	1	0	1	0	1	0	0
ReadSoft	1	0	1	0	1	0	0	0	0	0	0	0
Recipharm	0	0	0	0	0	0	0	0	0	1	0	1
Rejlers	0	1	0	1	1	0	0	0	0	0	0	1
Rezidor Hotel Group	1	0	1	0	1	0	0	0	0	0	0	0
RNB Retail & Brands	1	0	1	0	1	0	1	0	0	0	1	0

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
Rottneros	0	0	0	1	0	1	0	1	0	1	0	1
Rörvik Timber	0	1	0	1	0	1	0	1	0	0	0	0
SAAB Group	1	0	1	0	1	0	0	0	0	0	0	0
Sagax	1	0	1	0	1	0	0	0	0	1	0	1
Sandvik	1	0	1	0	1	0	0	0	0	0	0	0
SAS	1	0	1	0	1	0	0	0	0	1	0	0
SCA	1	0	1	0	1	0	0	0	0	0	0	0
Scandi Standard	0	0	0	0	0	0	0	0	0	1	0	1
Scandic Hotels	0	0	0	0	0	0	0	0	0	0	1	0
Scania	0	1	0	1	1	0	0	0	0	0	0	0
Seamless Distribution	0	0	0	0	1	0	0	1	0	0	0	0
SEB	1	0	1	0	1	0	0	0	0	0	0	0
Sectra	1	0	1	0	1	0	0	0	0	0	1	0
Securitas	1	0	1	0	1	0	0	0	0	0	0	0
Semafo	0	1	0	1	0	1	0	1	0	1	0	1
Semcon	0	1	0	1	1	0	0	0	0	0	0	0
Sensys Gatso Group	1	0	1	0	1	0	0	0	0	0	0	1
Shelton Petrolium	0	0	0	0	0	0	0	1	0	1	0	0
Sigma	0	1	0	1	0	1	0	0	0	0	0	0
SinterCast	0	1	0	1	0	1	0	1	0	1	0	1
Skanska	1	0	1	0	1	0	0	0	0	0	0	0
SKF	1	0	1	0	1	0	0	0	0	0	0	0
SkiStar	1	0	1	0	0	1	0	1	0	0	0	0
Softronic	1	0	1	0	1	0	0	0	0	1	0	0
Sportamore	0	0	0	0	0	0	0	0	0	0	0	1
SSAB	1	0	1	0	1	0	0	0	0	0	0	0
Stockwik Förvaltning	0	1	0	1	1	0	0	0	0	0	0	0
Stora Enso	0	1	0	1	0	1	0	1	0	0	0	0
Strax	1	0	1	0	1	0	0	0	0	0	0	0
Studsvik	0	1	0	1	0	1	0	1	0	0	0	0
SV. Handelsbanken	1	0	1	0	1	0	0	0	0	0	0	0
SWECO	1	0	1	0	1	0	1	0	1	0	1	0
Swedbank	1	0	1	0	1	0	0	0	0	0	0	0
Svedbergs	1	0	1	0	1	0	0	0	0	0	0	0
Swedish Match	1	0	1	0	0	1	0	0	0	0	0	0
Swedish Orphan Biovitrum	1	0	1	0	1	0	0	0	0	0	0	0
Swedol	1	0	1	0	1	0	0	0	0	0	0	0
Svolder	0	1	0	1	0	1	0	1	0	1	0	1
Systemair	1	0	1	0	0	1	0	1	0	1	0	1
Tele2	1	0	1	0	1	0	0	0	0	0	1	0
Telia Company	1	0	1	0	1	0	0	0	0	0	0	0
Tethys Oil	0	0	0	0	0	0	0	1	0	1	0	1
Tieto	1	0	1	0	1	0	0	0	0	0	0	0
Tobii	0	0	0	0	0	0	0	0	0	0	0	1

Companies	2011		2012		2013		2014		2015		2016	
	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal	Equal	Unequal
Traction	1	0	1	0	0	1	0	0	0	0	0	0
TradeDoubler	1	0	1	0	0	1	0	1	0	1	0	1
Transcom WorldWide	1	0	1	0	1	0	0	0	0	0	0	0
Transmode Holding	1	0	1	0	1	0	0	0	0	0	0	0
Trelleborg	1	0	1	0	0	1	0	1	0	0	0	0
Trention	0	1	0	1	0	1	0	1	0	1	0	1
Tribona	0	0	0	0	0	0	0	1	0	1	0	1
Trigon Agri	0	1	0	1	0	1	0	1	0	1	0	1
Troax Group	0	0	0	0	0	0	0	0	0	0	0	1
Unibet Group	0	1	0	1	1	0	0	1	0	0	0	0
Uniflex	1	0	1	0	1	0	0	0	0	0	0	0
Wallenstam	1	0	1	0	1	0	0	0	0	0	0	0
VBG Group	0	1	0	1	1	0	0	0	0	0	0	0
Venue Retail Group	1	0	1	0	1	0	0	0	1	0	0	0
Victoria Park	0	0	0	0	0	0	0	1	0	1	0	1
Wihlborgs Fastigheter	1	0	1	0	1	0	1	0	1	0	1	0
Viking Supply Ships	1	0	1	0	1	0	1	0	1	0	0	0
Vitec Software	0	1	0	1	1	0	0	0	0	0	0	0
Vitrolife	1	0	1	0	1	0	0	0	0	0	0	0
Volvo	1	0	1	0	1	0	0	0	0	0	0	0
Vostok New Ventures	1	0	1	0	1	0	0	0	0	0	0	0
XANO Industri	0	1	0	1	1	0	0	0	1	0	1	0
ÅF	1	0	1	0	1	0	0	0	0	0	0	0
Öresund	0	1	0	1	0	1	0	1	0	1	0	1
Total	**151**	**102**	**154**	**100**	**165**	**86**	**27**	**82**	**27**	**79**	**32**	**77**

In total 286 unique companies included in lists from 2011-2016.