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CSR reporting and stock prices

Taking a closer look at the Nordic market

Advisor:

Maria Gårdängen

Authors:

Freddy Andersson

Sadat Preteni

Abstract

Examensarbetets titel:	CSR redovisning och aktiepriser – en närmare blick på den nordiska marknaden
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Ämne/kurs:	FEKP01, Examensarbete Magisternivå Finansiering, 15 ECTS
Författare:	Freddy Andersson och Sadat Preteni
Handledare:	Maria Gårdängen
Nyckelord:	CSR, aktiepriser, social prestation, finansiell prestation, CSR ranking
Syfte:	Syftet med denna studie är att undersöka hur den frivilliga redovisningen av CSR i verksamhetsberättelser påverkar aktiepriser för företag noterade på den nordiska OMX börsen.
Metod:	En kvantitativ metod, med kvalitativa inslag, tillämpas. Den kvantitativa metoden används för att mäta hur CSR redovisning påverkar aktiepriser, medan det kvalitativa inslaget belyses vid analys och betygsättning av CSR redovisningar.
Teoretiska perspektiv:	Som teoretiskt ramverk används övergripande teorier om CSR, vilket sedan snävas in på stakeholder och shareholder theory, som kompletteras med tidigare forskning inom området CSR.
Empiri:	Tre olika CSR variabler betygsätts utifrån CSR redovisningar, och används som oberoende variabler för att förklara aktiepriser, vilka utgör den beroende variabeln.
Slutsatser:	Inga av de betygsatta CSR variablerna påvisar signifikans, vilket tyder på att CSR rapportering inte påverkar aktiepriser för företag noterade på den nordiska OMX börsen. Mätningarna påvisar vissa brister, vilket gör det svårt att generalisera resultaten.

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Five key words:	CSR, stock prices, social performance, financial performance, CSR ranking
Purpose:	The purpose of this study is to examine how the voluntary disclosure of Corporate Social Responsibility in annual reports affects the stock prices of corporations listed on the OMX Nordic Exchange.
Methodology:	A quantitative method, with qualitative elements, is applied. The quantitative method is used to measure how CSR reporting affects stock prices, while the qualitative element is highlighted when ranking CSR reports.
Theoretical perspectives:	As a theoretical framework, general theories of CSR are used, which are then narrowed down to stakeholder and shareholder theory, which is complemented with earlier research within the field of CSR.
Empirical foundation:	Three different CSR variables are ranked based on CSR reports, and used as independent variables to explain stock prices, which constitute the dependent variable.
Conclusions:	None of the ranked CSR variables show significance, which indicates that CSR reporting has no effect on the stock prices of corporations listed on the OMX Nordic Exchange. The measurements are susceptible to some flaws, which makes it difficult to generalize the results.

Table of contents

1 Introduction

1.1 Background

Global corporations have played a significant part in reshaping environments in the domestic as well as the international domain during recent decades. Industrialized states have been the main beneficiaries of globalization, while developing countries have had to deal with the adverse consequences of an increasingly globalized trading system. The stiffened competition following a globalized world economy has led to global supply chains. Corporations have kept high value-added operations in industrialized countries and outsourced low value-added operations to developing economies, with low wages and standards of labor. Moving from a domestic to an international arena, globalization has led to an ever increasing number of multinational corporations. According to John Ruggie (2007), the United Nations Special Representative on human rights and transnational corporations and other business enterprises, there are today approximately 77.000 global corporations with more than 770.000 subsidiaries, and millions of suppliers spread out across the world. Globalization has, thus, paved the way for very large and powerful corporations (Harrison, 2010). Along with this development, the relations between corporations and their stakeholders, such as shareholders, employees, customers, and the societies within which corporations operate, have been altered (Ruggie, 2007; Harrison, 2010).

Against the backdrop of their growing influence, global corporations have been facing increasing pressure to act responsibly, as well as to protect, promote and realize a sustainable development. This has prompted corporations to balance their global activities between growth strategies and considerations of corporate social responsibility (CSR) (Cernic, 2009; Kolk and Tulder, 2010). Taking into account the complicated global networks of subsidiaries and suppliers, attempted efforts to regulate the behavior of corporations have been unsuccessful. Instead, voluntary CSR initiatives have been promoted. The voluntary nature of such initiatives has arguably created a “moral free space” which does not mandate

corporations to comply with minimum standards of socially responsible behavior (Davis, Whitman and Zald, 2006). Sceptics have criticized this approach, arguing that although global corporations communicate their promotion of and contribution to a sustainable development, voluntary CSR initiatives are public relations strategies that corporations utilize to earn a license to operate, rather than truly committing to act in a socially responsible manner. It, then, seems as though globalization combines a race for both low production costs and increased demands for CSR (Heslin and Ochoa, 2008; Sacconi, 2004).

During recent decades, social audits have been used as a tool aimed at measuring the social performance of corporations. During 1995-1999, the asset value of mutual funds who invest in socially screened corporations increased from $162 billion to $1.5 trillion, creating stronger demand for CSR evaluation tools. As a means of assessing corporations' commitment to CSR, reporting services have been developed. As a response to requirements for CSR, many corporations now systematically study and report on their worldwide activities. This is mainly carried out by the development of CSR reporting mechanisms in annual reports. Along with the development of stronger requirements for CSR, independent organizations have engaged in the verification of CSR reports, such as the Dow Jones Sustainability Index and FTSE4Good Index (see DJSI.com). Already in 2005, 52 percent of the Fortune Global 250 largest corporations had started producing independently verified CSR reports, and in 2010, the Dow Jones Sustainability Index had analyzed 1393 corporations globally (Davis, Whitman and Zald, 2006).

1.2 Problem discussion

Globalization has led to increasingly powerful corporations and, as mentioned earlier, there has been increasing pressure on corporations to act socially responsibly in order to contribute to a sustainable development. In the absence of laws and regulation, however, corporations have mainly approached the issue of CSR in a voluntary manner, leaving critics to question the true CSR commitments of corporations (Ruggie, 2007; Harrison, 2010; Heslin and Ochoa, 2008; Sacconi

2004). Recent developments that have contributed in exerting pressure on multinational corporations to behave in a socially responsible manner include, among other things, stronger demand for CSR evaluation tools and the development of independent organizations with the purpose of verifying corporations' CSR reports. An increasing number of multinational corporations have intensified their devotion to CSR (Davis, Whitman and Zald, 2006; Fiori, Donato and Izzo, 2008). However, along with this development, a conflict of interest has arisen as corporate managers have found themselves in a position where they have to make a trade-off between satisfying all their relevant stakeholders on the one hand, and satisfying their shareholders on the other (Reich, 2008).

It has been argued that corporations that engage in CSR activities gain benefits such as, among other things, a better reputation, the ability to sell its products at premium prices, as well as the opportunity to recruit skilled employees that are committed to the corporation and its values. Furthermore, it has been argued that global investors are increasingly committed to CSR issues, and since CSR measures the trustworthiness of a corporation, it could have an impact on corporations' access to investor funds. This phenomenon highlights an increased attention to the need for corporations to engage in CSR (Morrison and Siegel, 2006; Heslin and Ochoa, 2008). However, even though many multinational corporations have implemented internal codes of conduct and, increasingly, communicate their commitment to CSR, the expansion of CSR to a global domain remains a challenge (Davis, Whitman and Zald, 2006). According to critics, corporations turn to CSR only when the benefits can be used as a means of maximizing profits and shareholder return, prompting the question of whether a multinational corporation has responsibilities that go beyond legal requirements to satisfy all its relevant stakeholders, or if the corporation has responsibilities only towards its shareholders (Davis, Whitman and Zald, 2006).

According to Fiori, Donato and Izzo (2008), empirical results stemming from research that have studied the relationship between corporate social performance and corporate financial performance have been scattered, yielding positive, neutral, and negative relations. Reasons put forward for these inconsistencies have been measurement problems connected to the difficulty of determining key performance indicators of CSR. Fiori et al. (2008) studied the relationship

between voluntary disclosure of CSR reports and the potential effect on the stock prices of Italian listed corporations. They argued that, due to different cultures, institutional environments and stakeholder expectations, it is unclear how CSR reports vary across different nations. Against this backdrop, we will replicate the study conducted by Fiori et al. (2008) in order to compare how the results of the relationship between CSR reporting in annual reports and stock prices on Italian listed corporations may differ from that of corporations listed on the OMX Nordic Exchange. In this regard, the question that we seek to answer in this study is the following:

How does voluntary disclosure of CSR in annual reports affect the stock prices of corporations listed on the OMX Nordic Exchange?

1.3 Purpose

The purpose of this study is to examine how the voluntary disclosure of Corporate Social Responsibility in annual reports affects the stock prices of corporations listed on the OMX Nordic Exchange. Furthermore, the purpose is also to compare our results to the results received by Fiori et al. (2008), regarding the effects of voluntary disclosure of CSR reports on the stock prices of Italian listed corporations.

1.4 Delimitation

In this study, we have chosen to include only the largest corporations from Sweden, Denmark, Finland and Iceland that are listed on the large cap list of the OMX Nordic Exchange. Norwegian corporations are not listed on the OMX Nordic Exchange and are, therefore, not included in this study. Furthermore, we will only include corporations that incorporate CSR reporting in their annual reports.

The reason for choosing corporations listed on the OMX Nordic Exchange is because previous, market-based, research has not fully covered this region. Furthermore, taking into consideration the argument from Fiori et al. (2008) that the effects of CSR reporting will depend on, among other things, cultural and institutional factors, we want to compare how the results of the relationship between CSR reporting and stock prices for corporations on the Nordic market differ from that of corporations listed on the Italian market.

2 Methodology and practical framework

2.1 Research approach

This study will be a replication of the study carried out by Fiori, Donato and Izzo (2008). The reason for choosing to replicate this study over other studies, is that we were interested in examining the effect of CSR reporting on stock prices for corporations listed on the Nordic market. After reviewing previous research on the topic, we found that there were many interesting studies performed, but very few of them examined different CSR activities' effect on stock prices, particularly on the Nordic market. Thus, we felt that there was a gap that needed to be filled, and a replication of the study conducted by Fiori et al. (2008) seemed like an opportunity for us to narrow this gap. Hence, we will conduct a quantitative market-based study of the relationship between corporate social performance and corporate financial performance on the Nordic market. More specifically, we will study this relationship by examining the potential effects of voluntary disclosure about Corporate Social Responsibility in annual reports on the stock prices of corporations listed on the OMX Nordic Exchange, during the period 2005-2009.

The study will take a deductive approach, since we start off by using available theory on CSR to form hypotheses about the relationship between corporate social and financial performance, which we will then test on the results attained from regression analyses on our collected data. Sources of data collection include the data bases Thomson Reuters and DataStream, the website of the Nasdaq OMX Exchange, as well as the website Largestcompanies.se. Furthermore, the study will include a qualitative element, as we will analyze qualitative data when gathering information about CSR from annual reports.

2.2 Sample

When examining the relationship between corporate social and financial performance, Fiori et al. (2008) focused on Italian listed corporations that prepared annual reports on a regular basis. In their conclusions, they argue that the relationship between CSR and firm performance strongly depends on the cultural context of different countries and markets, emphasizing, among other things, investors' sensitivity regarding short and longer term profitability, and the bargaining power of different categories of stakeholders. Thus, we choose to test the relationship between social and financial performance on corporations listed on the OMX Nordic Exchange, and compare our results to the results for the Italian market. We choose corporations listed on the OMX Nordic Exchange because we believe they are strong in the field of CSR, and because the cultural and market contexts are relatively homogenous between these countries. Furthermore, by conducting a market-based study on the relationship between CSR reporting and stock prices, we complement accounting-based studies that have examined the relationship between social and financial performance on the Nordic market. As mentioned earlier, corporations that are listed on the OMX Nordic Exchange are Swedish, Danish, Finnish, and Icelandic corporations.

For choosing the corporations to be included in our sample, we draw up some specific criteria. In order for corporations to be included, they have to:

1. Be publicly traded corporations and be listed on the OMX Nordic Exchange;
2. Belong to the largest corporations, measured by turnover, on the large cap list in each country. The reason for choosing the largest corporations is because we believe larger corporations have better opportunities of engaging in CSR, as they have more resources compared to smaller corporations, which may have a more difficult time allocating resources to areas that might hurt the bottom line (Reich, 2008; Burke et al., 1986);
3. Incorporate CSR reporting in their annual reports;
4. Belong to industries in which their core business is not financial services. The reason for excluding financial service corporations is because we believe, in

accordance with Fiori et al. (2008) that, due to the specific nature of their core business and risk profile, financial service corporations such as banks and insurance companies would alter the average results if included in the sample.

For determining the largest corporations, measured by turnover, in each country, we utilize the website www.largestcompanies.se. This web-based resource provides financial information on the Nordic countries' 100.000 largest corporations, and provides top-lists of how the corporations relate to each other. However, it also includes corporations that are not publicly traded. Therefore, we include in our sample only the largest corporations by turnover that are also listed on the large cap list of the OMX Nordic Exchange, and which are not financial service corporations. In order to determine which corporations are listed on the OMX Nordic Exchange, we browse the website www.nasdaqomxnordic.com – the official website of the Nasdaq OMX. Finally, after locating the largest corporations in each country, we review all of the corporations' websites to determine whether or not the corporations incorporate CSR reporting in their annual reports. Consequently, corporations that are included among the largest corporations, but who do not incorporate CSR reporting in their annual reports, are excluded from the sample. Thus, this screening method leaves us with a sample comprising the largest corporations by turnover from each country that are listed on the large cap list of the OMX Nordic Exchange, and that incorporate CSR reporting in their annual reports. From this original sample, we decide to keep ten of the largest corporations from each country, in order to reach an equal distribution between the countries included, yielding a sample of 40 corporations and 200 observations during the time period 2005-2009. This can be compared to the sample of Fiori et al (2008), which includes 33 corporations and 198 observations during the period 2002-2007. We compensate for the shortage of one year by adding more corporations to our sample instead, since we believe that a larger sample may provide a better spread than a longer time period.

It should be noted here that corporations from Iceland will be treated differently. Although they are large corporations in Iceland, they are not included in the large cap list of the OMX Nordic Exchange. However, due to the fact that they form part of the Nordic market, we feel obliged to include these corporations

in our sample. Otherwise, we would not be examining corporations on the Nordic market.

2.3 Analysis of lost observations

Reasons for lost observations from our sample can be categorized into the following:

1. Missing corporations from Iceland
2. Lack of data in DataStream
3. Entry into stock market during our testing period
4. Different fiscal years

As mentioned above, we pursue an equal distribution of ten corporations from each country. There are no issues in locating ten corporations that fulfill our requirements for sample inclusion from Sweden, Denmark and Finland. However, there are only eight corporations from Iceland listed on the OMX Nordic Exchange, and three of these are automatically excluded from the sample as they do not incorporate CSR reporting in their annual reports. An additional corporation from Iceland is excluded as it provides an annual report incorporating CSR in Icelandic. Furthermore, due to missing data in DataStream, we cannot find all the variables needed for the Icelandic corporations that are included in the sample. Beyond Icelandic corporations, there is one corporation from Finland in our sample that is not publicly traded until 2006, meaning that we lose one observation from this corporation for 2005. Regarding corporations from Denmark, one corporation is excluded because it has a stock price that is many times larger than the stock prices of other corporations in the sample. For this reason, it is considered an outlier, as the extreme value stemming from the large stock price would alter the results. When excluding this corporation from our sample, we lose five observations. Finally, one additional observation from another Danish corporation is lost due to the lack of data in DataStream. Hence, instead of a sample comprising 40 corporations with 200 observations, we end up with ten corporations from Sweden, Denmark and Finland, respectively, and four

corporations from Iceland, yielding a total of 158 observations. In order to make our study comparable to that of Fiori et al. (2008), we feel that we must have roughly as many observations. Hence, we make up for the lost observations by replacing the excluded corporations from Iceland and Denmark with corporations from our original sample. Since the corporations used to replace lost observations are taken from the original sample, they comply with the criteria established above for sample inclusion. Thus, the six missing corporations from Iceland and the missing corporation from Denmark will be replaced with three Swedish, three Finnish, and four Danish corporations. This way, we end up with an as equal distribution as possible of corporations among the countries included – a sample comprising 13 Swedish, 13 Danish, 13 Finnish and 4 Icelandic corporations, respectively, with a total of 208 observations.

2.4 Dependent variable

There are two approaches for studying the relationship between corporate social and financial performance, namely through accounting-based and stock market-based measures. Although both of these approaches measure financial performance, they have a different focus. Accounting-based measures focus on a corporation's historical accounting profitability, including performance indicators such as return on assets, return on equity, total assets, growth, etc. It has been argued that, due to differences in accounting procedures and managerial manipulation, this approach can be biased. Market-based measures, on the other hand, focus on investors' evaluations and expectations regarding the performance of a corporation. Because of this, market-based measures are not susceptible to accounting rules and managerial manipulation (Scholtens, 2008). In their study, Fiori et al. (2008) assume that capital markets are semi-strong efficient, suggesting that the market recognizes information available to the public, which is then embedded in the stock prices of corporations. This assumption indicates that the market recognizes when corporations communicate their CSR reports to the public, and that the incorporation of CSR reports will affect stock prices. This view is in line with that of Fama (1970) and Mackey, Mackey and Barney (2007),

who argue that in semi-strong efficient capital markets, stock prices will, on average, reflect publicly available information regarding the perceived value of a corporation's assets. Against the backdrop of this discussion, we choose to use stock prices as the dependent variable.

2.5 Independent variables

There are many ways of measuring corporate social performance. A recent development is the growth of organizations engaged in independent verification of CSR reports. For example, the Dow Jones Sustainability Index and the FTSE4Good Index are two of the largest organizations that rank global corporations based on their social performance. Furthermore, researchers studying the relationship between social and financial performance tend to focus on different aspects of CSR, such as the environment or community involvement. Brammer, Brooks & Pavelin (2006) focus on CSR practices related to employment, environment and community involvement. Fiori et al. (2008) have replicated the method of Brammer et al. (2006) when conducting their study on the Italian market. Since we replicate the study of Fiori et al. (2008), we, too, will focus on these three aspects of social performance as our independent variables.

2.6 Grading CSR reporting

In order to measure the social performance of corporations listed on the OMX Nordic Exchange, we analyze their annual reports and grade their CSR reporting, using objective criteria. As mentioned above, we divide corporate social responsibility into three different parameters, namely employment, environment and community involvement. For each of these three parameters, we then create a set of criteria to be followed when allotting scores for each corporation. More specifically, the different CSR parameters are given the following criteria, in line with the criteria used by Brammer et al. (2006) and Fiori et al. (2008):

- Employment

1. Health and safety systems
2. Systems for employee training and development
3. Equal opportunities policies
4. Systems for good employee relations
5. Systems for job creation and security

- Environment

1. Quality of environmental policies
2. Environmental management systems
3. Environmental reporting

- Community involvement

1. Community responsiveness

After setting these criteria, we collect annual reports from all corporations in our sample, which we thereafter analyze and grade in order to determine a performance score for each of the three CSR parameters. Different scores are set on the different parameters. Each criteria on the employment parameter can receive scores on a scale ranging from 0-3, yielding a maximum score of 15. The criteria on the environment parameter can receive scores on a scale ranging from 0-4, yielding a maximum score of 12. Finally, the single criteria on the community involvement parameter can receive scores on a scale ranging from 0-3, yielding a maximum score of 3. Starting off with the employment parameter, we set a score of 0 if the corporation does not consider the specific criteria at all; a score of 2 if it considers the specific criteria by only briefly describing it; and a score of 3 if the corporation takes the specific criteria into consideration by providing a good description and motivation. Regarding the environment parameter, we set a score of 0 if the corporation does not take into account the specific criteria at all; a score of 2 if it only briefly considers the criteria and provides a poor description; a score of 3 if it considers the criteria but provides a broader description; and a score of 4 if the corporation provides a broad and exhaustive description of the criteria. Lastly, for the community involvement parameter, we set a score of 0 if the corporation does not take the specific criteria

into consideration at all; a score of 2 if the corporation briefly takes the specific criteria into consideration and provides a short description; and a score of 3 if the corporation takes the specific criteria into account and provides a good description and motivation.

After allotting scores on the different criteria for each parameter for all corporations in our sample, we then sum the scores for each parameter, leading to independent variables consisting of the following:

- Tot_Emp – representing the total score of the variable employment
- Tot_Env – representing the total score of the variable environment
- Tot_Com – representing the total score of the variable community involvement

This method corresponds to the method used by Brammer et al. (2006) and Fiori et al. (2008). The reason for using this method is mainly because we do not have access to CSR ranking databases, such as the Dow Jones Sustainability Index or the FTSE4Good Index, or equivalent indexes, which perform rankings on Nordic listed corporations. Furthermore, we use this method of measuring social performance in order to take into consideration the non-linear relationship between providing and not providing CSR reporting in annual reports. Thus, we agree with the underlying reasoning of this method, and the argument that there is a non-linear relationship between providing and not providing a CSR report.

Taking into account that the number of variables for each of the CSR parameters is different, we must weigh them in order to make them homogenous. Since the employment parameter has five variables, the environment parameter has three variables, and the community involvement parameter only has one variable, Fiori et al. (2008) weighted the variable U_EMP as 20 percent, U_ENV as 35 percent, and U_COMM as 45 percent. However, Brammer et al. (2008) use a slightly different method. They weigh the three variables at an equal proportion of approximately 33 percent. But because the different parameters have a different number of variables, and thus a different total score, Brammer et al. (2006) adjusted these scores by recalculating each parameter's total score to an average score ranging from 0 to 3. We test both methods, and they do not yield significantly different results. Even though both methods yield more or less the same results, we choose to use the method used by Brammer et al. (2006),

because we feel that it is a slightly better method. Thus, we name our weighted independent variables UEmp for the total score of the variable employment, UEnv for the total score of the variable environment, and UCom for the total score of the variable community involvement, to indicate that they are weighted according to Brammer et al.'s (2008) method conducted in the U.K.

2.7 Control variables

In accordance with the study conducted by Fiori et al. (2008), we use the following variables as control variables:

1. Size, expressed by Total Assets (TA)
2. Profitability, expressed by Return on Equity (ROE)
3. Financial leverage, expressed by the Debt/Equity ratio (D/E)
4. Operating risk, expressed by Beta (B)

Beurden and Gössling (2008) argue that size is important when corporations determine whether or not to pursue CSR activities, and that the size of a corporation should be taken into account when conducting studies of the relationship between social and financial performance. Researchers that have used size as a control variable have often found a positive relationship between social performance and the size of the corporation, when conducting studies on the relationship between social and financial performance. One argument used, among many, is that large corporations have more money and resources to spend on CSR, compared to that of smaller corporations. Waddock and Graves (1997) argued that size should be included as a control variable, as they had found evidence that larger corporations have bigger opportunities of engaging in socially responsible behaviour compared to that of smaller corporations. In other words, larger corporations have more resources to commit to the cause of CSR without hurting their bottom line, whereas smaller corporations do not have this ability.

Risk is measured by the level of debt/equity, as this ratio is considered to be a proxy for management's risk tolerance. According to Waddock and Waddock (1997), the risk tolerance of management influences their attitude towards CSR

activities. Since risk tolerance influences the choice of whether or not to engage in socially responsible activities, risk tolerance, expressed as D/E, is considered to be a relevant control variable. Moreover, some studies have used industry as a control variable. Different industries operate in different contextual environments, meaning that they are susceptible to different social, environmental and financial concerns. Beurden and Gössling (2008) argue that even though the influence of industry is not as powerful as that of firm size, it does influence the relationship between corporate social and financial performance, and is thus a considered a relevant control variable. In accordance with Fiori et al. (2008) we express industry risk by the Beta value. Finally, we add profitability, expressed as return on equity (ROE), as a control variable.

2.8 Choice of regression

Fiori et al. (2008) begin their model by presenting some descriptive statistics in order to view the yearly performance for each of the three CSR parameters. Thereafter, they explain that they use a cross-sectional regression method to test if a correlation between the independent variables and the dependent variable exists. However, a preferable regression method would be to use a panel data analysis, which is a combined cross-sectional analysis and time-series analysis (Kozhan, 2010). Along these lines, we believe that since Fiori et al. conduct their study under a period of six years, there is an aspect of time that should be taken into consideration. As we find their data to be similar to a panel data, we will also test for autocorrelation when replicating their regression model.

2.9 Replicating regression

To replicate the regression model of Fiori et al. (2008), we conduct an Ordinary Least Square (OLS) regression. According to Okamato (2009), many studies researching the relationship between social and financial performance use a linear regression analysis. The reason for doing so is because analysts, when using a

linear regression, have the ability to simplify and easily comprehend reality, as well as to use multiple models and statistical significance tests. To examine the relationship between the independent variables and the dependent variable, the following regression model will be used:

$$SP = \alpha + \beta_1 UEmp + \beta_2 UEnv + \beta_3 UCom + \beta_4 ROE + \beta_5 B + \beta_6 TA + \beta_7 DE$$

Where:

- SP – Stock prices for the corporations in the sample (dependent variable)
- UEmp – CSR variable related to employees (independent variable)
- UEnv – CSR variable related to the environment (independent variable)
- UCom – CSR variable related to the community involvement (independent variable)
- ROE – Return on equity, measuring profitability (control variable)
- B – Beta value, measuring industry risk (control variable)
- TA – Total assets, measuring size (control variable)
- DE – Debt/Euity ratio, measuring management's risk tolerance (control variable)

In their study, Fiori et al. (2008) only examine whether or not any of the three CSR parameters affect stock prices. Hence, they develop a hypothesis of how they think the different CSR parameters will affect the stock prices. We replicate this hypothesis and apply it on the corporations included in our sample. Additionally, we also present descriptive statistics, with a view to describing the development of the corporations' CSR commitments, during the time period 2005-2009.

2.10 Hypothesis

Before conducting their regression analysis, Fiori et al. (2008) expected that voluntary disclosure about CSR regarding the employees would have a positive and significant relationship with stock prices, while they believed that disclosure about CSR regarding the environment and community involvement would be

negatively and significantly related to stock prices. These arguments were based on the idea that in Italy, investors view investments in employees as investments that will benefit the corporation and lead to growth and stability. They also took into account the strong bargaining power of Italian trade unions. On the other hand, they viewed CSR commitments to the environment and the community as negative, because of investors' perceived focus on short-term profit maximization, rather than considerations of stakeholder interests. The cultural environment in the Nordic countries differs from that of Italy, but we believe that the arguments laid out above may be equally as relevant for corporations listed on the Nordic markets. We have no reason to believe that any investor would view investments in employees as something negative, and the prevalence of traditionally strong trade unions in Sweden, for example, reinforces our belief that investments in employees should be considered positive even in the Nordic countries. Regarding investments in CSR activities relating to the environment and community involvement, we believe, in accordance with Reich (2008), that investors are universally driven by short-term profits and that it is not necessarily attributed to a cultural context. For these reasons, we agree with the hypotheses formed by Fiori et al. (2008) and expect a positive relationship between CSR activities regarding employees and stock prices, and a negative relationship between CSR activities regarding the environment and community involvement and stock prices.

2.11 Alternative replicating regression

In the previous model, we explained how we test, with a regression model, the relationship between the independent variables and stock prices. However, on page 9 in their study, Fiori et al. (2008) state the following: "in order to simplify the scenario of the firms and to easily measure the financial returns, our hypothesis states that the firms' performance is measured by the stock market prices trend along the period of the analysis". In contrast to the previous regression model, where we only measure stock prices in real terms, this statement indicates that they have measured the relation between the independent variables and stock price *returns*. This statement creates a bit of confusion as to

which one of the methods they have used. Consequently, we choose to replicate their original regression model, with the same assumptions and hypothesis as before, but this time we measure stock price returns rather than historical stock prices, as the dependent variable. The regression model used in this endeavor is the following:

$$R = \alpha + \beta_1 UEmp + \beta_2 UEnv + \beta_3 UCom + \beta_4 ROE + \beta_5 B + \beta_6 TA + \beta_7 DE$$

Where:

- R – Stock price returns for the corporations in the sample (dependent variable)
- UEmp – CSR variable related to employees (independent variable)
- UEnv – CSR variable related to the environment (independent variable)
- UCom – CSR variable related to the community involvement (independent variable)
- ROE – Return on equity measuring profitability (control variable)
- B – Beta value measuring industry risk (control variable)
- TA – Total assets measuring size (control variable)
- DE – Debt/Euity ratio measuring management's risk tolerance (control variable)

2.12 Proposed adjustments to the replicating regression

After reviewing and analyzing the regression model used by Fiori et al. (2008), both when testing for stock prices in real terms and for stock price returns, we believe that the model is susceptible to some faults which, according to us, need to be corrected. In this regard, we will suggest some adjustments that may improve the model. First and foremost, rather than measuring stock prices and the return on stock prices, as indicators of financial performance, we find it more interesting to use risk adjusted returns. Risk adjusted returns take into consideration the risk taken to receive those returns, as well as the dividends paid out to shareholders during the year. Therefore, risk adjusted returns seem to provide a more accurate

reflection of the returns of investors and is, thus, a better indicator of financial performance. This view is reinforced by Modigliani and Modigliani (1997), when they speak of risk-adjusted performance. They argue that total return, for example, ignores risk and because of this, it cannot be considered a complete measure of a stock's performance. A more accurate approach is, then, to adjust it for risk. Thus, we adjust the previous regression model by testing the effect of CSR reporting on risk adjusted returns. Risk adjusted returns will be calculated using the Capital Asset Pricing Model (CAPM), which is as follows:

$$E(r) = r_f + \beta(r_m - r_f)$$

Where:

$E(r)$ = Expected return of the security

r_f = Risk-free rate

β = Beta of the security

$r_m - r_f$ = Market risk premium (Koller, Goedhart and Wessels, 2005).

CAPM measures the expected return of a stock. It is based on the idea that investors require compensation for investing money over a period of time, which is represented by the risk-free rate, and that investors require a compensation for taking an additional risk, which is calculated by multiplying the beta value with the market risk premium. Generally, if the required return on a stock is higher than the expected return from the CAPM, investment in the stock should be undertaken and vice versa (Koller, Goedhart and Wessels, 2005). We use the CAPM to compute the risk adjusted returns by translating the CAPM into the following model:

$$RA(r) = r_{stock} + \beta(r_m - r_f)$$

Where:

$RA(r)$ = Risk adjusted return of the security

r_{stock} = Return of the security

β = Beta of the security

$r_m - r_f$ = Market risk premium

When applying this model to compute risk adjusted returns, we assume a market risk premium of 4.7 percent. This value lies within the 4.5-5.5 percent historical range of market risk premiums, according to Koller, Goedhart and Wessels (2005). According to a study carried out by PricewaterhouseCoopers, the average market risk premium in Sweden during the time period 2005-2009 is 4.7 percent. This average market risk premium is in line with the market risk premium calculated by Damodaran (2011) from the Stern School of Business at New York University. Damodaran provides an exhaustive table of Credit Default Swaps (CDS) and market risk premiums comprising many countries. From his table, we find that the market risk premium for Denmark and Finland is equal to that of Sweden. However, due to the larger risk inherent in Iceland, the market risk premium for Iceland was higher than that of the other Nordic countries.

We also believe that the social performance of corporations, measured by grading the different CSR variables, should be adjusted. Rather than using the total score for each CSR parameter, we find it more interesting to examine how changes in social performance, measured in terms of the improvement in CSR reporting, may or may not affect the financial performance of corporations, measured as risk adjusted returns. An annual report will not have an affect on the stock prices or the controlling variables until it is released – for example, the annual report of 2004 will not have an affect until 2005. When not taking into consideration the changes in social performance from one year to the other, we grade CSR reporting in annual reports during the period 2004-2008, thus measuring the effects on stock prices and control variables during the period 2005-2009. However, since measuring the changes in social performance entails

subtracting the annual report t-1 from the annual report t, we have to also grade annual reports from 2003, in addition to the grading already performed. By doing this, we will lose three observations due to missing annual reports. Some final adjustments to the regression model used by Fiori et al. (2008) are made by excluding the beta value as a control variable, as it will be included when computing risk adjusted returns, and by taking the natural logarithm of total assets. The reason for doing so is because comparing total assets, presented in real terms, with the risk adjusted returns would result in an incorrectly specified standard deviation. Thus, the modified regression model is be the following:

$$RA(r) = \alpha + \beta_1 UEmp + \beta_2 UEnv + \beta_3 UCom + \beta_4 ROE + \beta_5 \log TA + \beta_6 DE$$

Where:

$RA(r)$ = Risk adjusted returns for the corporations in the sample (dependent variable)

- UEmp – change in the CSR variable related to employees (independent variable)
- UEnv – change in the CSR variable related to the environment (independent variable)
- UCom – change in the CSR variable related to the community involvement (independent variable)
- ROE – Return on equity measuring profitability (control variable)
- logTA – natural logarithm of total assets measuring size (control variable)
- DE – Debt/Euity ratio measuring management's risk tolerance (control variable)

After testing a model that is significant, we will check for Heteroskedasticity. This is done by using White's Heteroskedasticity Test on squared residuals, and thereafter by using White's Heteroskedasticity Test with cross-terms. If these tests are significant, it means that there is Heteroskedasticity, which will be adjusted for by using the regression with White Heteroscedasticity-Consistent Standard Errors and Covariance regression. Furthermore, we will check for specification errors up to the fifth degree. This will be done using the Ramsey Reset Test. Subsequently, we will check for multicollinearity, using a correlation matrix,

where multicollinearity will not be an issue as long as the correlation is below 0.8. In addition to these tests, we will look for normal distribution in all the variables and the model's residuals, using the Jarque-Bera Normality Test. Because we have a sample exceeding 200 observations, we refer to the central limit theorem (CLT), which states that we can assume normality (Ramanathan, 2002). Finally, Fiori et al. (2008) state that they have a cross-sectional data. However, we feel that there is also a time aspect that needs to be taken into account. This aspect will be taken into consideration by testing for autocorrelation, using the Box-Ljung Q-statistics.

2.13 Internal Validity

Internal validity refers to whether or not a causal relationship between two or more variables is sustainable. Furthermore, internal validity also refers to the ability to control the study at hand. For example, when changes in the independent variable(s) are the factors that contributes to an empirical result, and when other factors do not affect this result, the internal validity is strong (Bryman and Bell, 2005). In our case, there is a presumed causal relationship between corporate social performance and corporate financial performance. However, due to the lack of consistency in the research conducted to date, there is a prevalent uncertainty regarding the causality of this presumed relationship. Researchers have not been able to conclude whether it is a strong financial performance that leads to a good social performance, or if a good social performance leads to a strong financial performance. There is, thus, an uncertainty as to whether the dependent variable or the independent variable drives the causality (Scholtens, 2008). Furthermore, researchers that only focus on one aspect of CSR have been criticized since this leads to measurement problems, and researchers that only use CSR as the independent variable, without including control variables, have been equally as criticized, since they loose the ability of controlling for factors beyond CSR that may affect the relationship between social and financial performance. In our study, we divide CSR into three different parameters and also include four control variables in order to examine if there are outside factors affecting the relationship

that we try to establish. The uncertainty regarding the causal relationship between social and financial performance generally weakens the internal validity of studies on CSR. However, due to the fact that we include control variables, our validity might not be weakened equally as much. Except for the fact that we include control variables, the validity in our study is strengthened because we include the control variables that have been the most recurring in similar studies. Our validity may weaken if there are more appropriate control variables that we fail to include, which would make our study susceptible to measurement problems. For example, it is argued that R&D and advertising are appropriate control variables, which we do not include in this study.

2.14 External validity

External validity refers to whether or not it is possible to extend the results from one study to another context. In other words, external validity poses the question if it is possible to generalize the results obtained from a study to a larger population (Bryman and Bell, 2005). The ability to generalize is influenced by our sample selection and data First and foremost, some problems with the internal validity make it difficult for us to generalize our results beyond the population of our study. These problems relate both to the uncertainties regarding the causal relationship between social and financial performance and to issues relating to measurement problems. Fiori et al. (2008) argue that CSR is a work in progress and that it is largely context specific. Thus, the results of their study will likely differ in different countries with diverse cultures and markets. Because of our limited ability to generalize, the external validity of this study will most likely not be high. Furthermore, we have lost a number of valuable observations from our original sample due to unavailable data coverage from DataStream. As explained earlier, we adjusted for these lost observations by replacing them with corporations from our original sample. Taken altogether, it does not seem as if this study has a good external validity, suggesting that it is difficult to generalize the results from this study to contexts beyond it.

2.15 Reliability and replicability

Reliability refers to the possibility of repeating the same study and achieving the same results. For a study to be reliable, it requires that both measurements and data sources are reliable. Replicability, on the other hand, refers to the possibility of other researchers to replicate a study at a later date, using the same method, and achieving the same results (Bryman and Bell, 2005). In this study, we use the data bases DataStream and Reuters to collect control variables and the dependent variable. In the absence of access to CSR ranking lists and indexes, such as the Dow Jones Sustainability Index or the FTS4Good Index, we use the annual reports of corporations included in our sample in order to collect information on the independent variables, consisting of the CSR parameters. We consider both DataStream and Reuters to be reliable data systems, since they collect financial information from the financial reports of corporations listed in the database. For this reason, we consider both the control variables and the dependent variable used in this study to be reliable, as well as accurate. We, therefore, believe that the use of these reliable databases improves our reliability.

Since we do not have access to CSR ranking indexes, we apply the method called “content analysis”, by analyzing and grading the CSR reporting of the corporations included in our sample. As explained earlier in this text, we use an objective set of criteria when grading CSR reports. We believe that this objective criteria improves our reliability in terms of measuring the social performance of corporations in the Nordic market. However, there is always a possibility of measurement subjectivity, which we have to take into consideration. In this regard, it is possible that we can be subjective and allot biased scores to certain corporations – for instance if a corporation is perceived to be exceptionally strong in its CSR commitment. While the objective criteria enhance our reliability, the potential for biasness can bring it back down a notch.

We consider this study to have a good replicability. As it is a replicating study of Fiori et al. (2008), we carefully study their methodological approach and provide, as much as possible, consistent and exhausting explanations of our approach, as well as of the information sources we use. Other researchers attempting to replicate this study may, however, receive different results, which,

once again, may depend on the country in which the study is conducted and on the corporations used in the sample.

3 Theoretical framework

3.1 Defining Corporate Social Responsibility

There are many different definitions of CSR and as of current, there does not seem to be any consensus of a particular correct definition (van der Putten, 2005). It is common ground for most definitions of CSR to view corporations as actors with social responsibilities towards society. The argument runs that in order to protect their primary (or legitimate) stakeholders – shareholders, employees, suppliers, consumers and society as a whole – corporations should engage in sustainable economic activities. CSR actions are not legally mandated, but rather voluntary initiatives that go beyond legal requirements, with a view to protect their stakeholders. CSR is based on the idea that since the society has given a corporation the franchise to operate, it expects it to behave in a socially responsible manner (Saha and Nath, 2008; Davis, Whitman and Zald, 2006). Hence, CSR emphasizes that corporations should safeguard the interests of its stakeholders, rather than strictly focusing on profit maximization. Against this background, it seems as though the binding element of CSR is the study of what society demands from corporations, and the extent to which society's demands can be realized in practice (Saha and Nath, 2008; Heslin and Ochoa, 2008; Kolk and Tulder, 2010; Morrison and Siegel, 2006).

CSR can be divided into four overarching definitions:

1. **Corporate philanthropy** – the level of engagement to CSR, and the approach to address social concerns, is left to the corporations' own discretion. Thus, this approach is not mandated in law, but rather voluntary in nature.

2. **Beyond legal compliance** – the CSR efforts of corporations are voluntary in nature, but as they take into consideration internationally agreed norms and standards, they go beyond legal compliance.

3. **Self-regulation and compliance systems** – corporate compliance is best ensured through sanctions by domestic governments. This definition encourages voluntary initiatives as a means of assisting corporations in the compliance with governmental regulations.

4. **Human rights** – by emphasizing human rights in areas of environmental protection, safety at work, elimination of child labor and anti-corruption, this definition is connected to regulation, such as international human rights law (McInerney, 2007; van der Putten, 2005).

Since all of the above definitions are useful, it is not an easy task to determine which one of them to use in this study. Using economic terminology, which emphasizes externalities and spillovers, we may decide on which one of the above definitions is most useful. Negative externalities refer to costs that certain economic activities transfer to society. Viewed through the perspective of negative externalities, the philanthropic definition is not of practical use since it would be impractical to leave corporations with full discretion of whether or not they should reduce externalities. Furthermore, the human rights definition is not sufficient as it is only linked to a subset of externalities. The most appropriate approach seems to be a definition that encourages voluntary initiatives to assist compliance to agreed norms and standards, while simultaneously promoting law and regulations (McInerney, 2007). The definition of the European Commission runs along these lines and combines the second and third definition listed above: "By stating their social responsibility and voluntarily taking on commitments which go beyond common regulatory and conventional requirements, which they would have to respect in any case, companies endeavor to raise the standards of social development, environmental protection and respect of fundamental rights and embrace an open governance, reconciling interests of various stakeholders in an overall approach of quality and sustainability" (Sacconi, 2004). We choose to use this definition of CSR in this study.

3.2 Historical overview

Corporations' main goal has always been to satisfy investors' profit demands. As of late, however, multinational corporations have increasingly devoted attention to CSR. Although the term CSR is relatively young, the attention to issues relating to a more sustainable development, in terms of strong economic growth that is both socially and environmentally responsible, is not new. For example, the Bruntland Commission expressed these concerns in its 1987 Bruntland report. Emphasizing the economic, social and environmental components of CSR, the term "Triple P" – denoting People, Planet, Profit – was developed during the 1990's with the aim of encouraging corporations to respond to requirements for a sustainable development (Kolk and Tulder, 2010, van der Putten, 2005). Waves of corporate philanthropy hit the 19th and 20th centuries, and extensive community services stemming from the industrial revolution's great profits are considered to be the forerunner of what we today define as CSR. Approximately 50 years ago, the term Business Social Responsibility was frequently used. During this time, Karl Caysen launched the term "the soulful corporation". According to Caysen, a soulful corporation referred to "a new, more responsible large enterprise", stating that "no longer the agent of proprietorship seeking to maximize return on investment, management sees itself as responsible to stockholders, employees, customers, the general public, and, perhaps most important, the firm itself as an institution." This approach is generally known as the "stakeholder approach". However, despite the usefulness of corporate giving, externally oriented CSR proved more challenging than anticipated. Questions regarding the extent of corporations' responsibilities towards society arose, and it was questionable whether the costs arising from purposes that were not related to improving profits could be justified by corporations to their shareholders. This approach is known as the "shareholder approach". Stakeholder and shareholder approaches form the basic building blocks of discussions relating to CSR, and have caused a dilemma for corporate managers who are in a position where they have to make trade-offs between satisfying shareholders, and acting socially responsibly to please the surrounding communities in which they operate (Davis, Whitman and Zald, 2006).

3.3 Stakeholder and Shareholder approach to CSR

The stakeholder and the shareholder approaches create tensions in the debate of whether or not a corporation has the capability of engaging in CSR. According to the stakeholder approach, corporations need to take into consideration CSR in order for both the corporation and society to develop. By doing so, five key drivers of the corporations' business can be positively affected, namely market share growth, organizational learning, committed employees, supportive stakeholders and positive investor relations (Morrison and Siegel, 2006; Heslin and Ochoa, 2008). During the last decade, corporate activities in the global south have been booming. As a result of the creation of new consumer markets for their products and services in developing countries, corporations have been able to earn high profits and simultaneously help poor people through foreign direct investments (FDI) (Morrison and Siegel, 2006; Heslin and Ochoa, 2008). After successful investments and projects, strategic CSR initiatives could lead to enhanced organizational learning, innovation and know-how, which can then be used in future projects to improve social and environmental conditions in the communities in which the corporations operate. Moreover, it has been argued that CSR could be utilized as a way of attracting and retaining competent employees. Finally, the stakeholder approach argues that commitment to CSR can improve corporations' trustworthiness, and improve the relations with their stakeholders. Along these lines, positive opinions of CSR activities can also improve corporations' prospects of gaining investor funding, as global investors are increasingly committed to CSR. Highlighting an ever increased attention to the importance of CSR and a reluctance to allocate funding to corporations not committed to CSR is the recent development of "green" mutual funds, alongside traditional large investment banks, investing in socially responsible corporations (Morrison and Siegel, 2006; Heslin and Ochoa, 2008).

The shareholder approach views CSR as a means of gaining benefits trough employment of profit-maximizing CSR. In other words, the shareholder approach argues that for a corporation to engage in CSR activities, the benefits of doing so must offset the costs associated with committing resources to CSR. Very many global corporations are nowadays implementing codes of conduct and internal

monitoring systems, but the expansion of CSR still remains challenging. As the shareholder approach considers the satisfaction of shareholders' profit demands to be the sole purpose of a corporation, CSR cannot be applied to a corporation (Davis, Whitman and Zald, 2006). Proponents of this approach argue that enterprises, due to stiffened competition, must refrain from actions that might negatively affect profits, and only embrace CSR as a means of reducing costs in order to improve the bottom line, as well as avoiding public demands of regulation. Furthermore, despite progress made in regards to CSR engagement through implementation of codes of conduct, it is argued that corporations cannot be socially responsible as they, in competitive markets, still have a responsibility of attracting and retaining consumers and investors (Reich, 2008). Supporting the argument that, under fierce competition, corporations cannot afford pursuing social ends at the cost of losing customers and investors, Milton Friedman argued that "the business of business is to make a profit, not to engage in beneficial acts" (Friedman, 1970). This statement implies that corporations should not pursue social ends as they are not appropriate vehicles for social benevolence (Reich, 2008). In regards to the argument from proponents of the stakeholder approach that CSR offers corporations the ability of charging a higher price for their products,, proponents of the shareholder approach provide the counter-argument that consumers are reluctant to pay a higher price for products that contribute to a social good unless it is of added value to the consumer personally, adding also that consumers and investors do not care so much about social responsibility so as to make financial sacrifices for it (Reich, 2008). Also, as a response to the argument that investors are reluctant to allocate funding to corporations that are not committed to CSR, the shareholder approach suggests that investment bankers and analysts are only interested in corporations' bottom lines when assessing share price and shareholder returns, and that investors do indeed promote better corporate governance, but not corporate social responsibility. Share price is considered to be the best measurement of corporate profitability and success, but there does not seem to be equivalence in terms of measuring CSR success. Attempts to calculate the triple bottom-line performance of corporations seem to be hindered by the fact that tough competition forces corporations to safeguard the interests of its consumers and investors at the cost of being socially responsible. Thus, the shareholder approach argues that a corporation must reduce costs to

make a profit, and that actions that lead to higher costs and less profit would jeopardize the corporations' competitive advantage, as rivals not committed to CSR could be more profitable (Reich, 2008).

3.4 Previous research

As earlier mentioned, the results of research that has focused on the relation between social and financial performance have been largely inconsistent, as a consequence of, among other things, the lack of a consistent definition of CSR and difficulties determining how to measure the social performance in relation to the financial performance of corporations.

3.4.1 Accounting-based research

Carlsson (2006) conducted an accounting-based study of the relationship between corporate environmental performance and corporate financial performance on Scandinavian corporations during 2003-2004. He focused on Tobin's q, return on assets (ROA) and return on equity (ROE). The results of this study suggested that there is a neutral relationship between environmental performance and financial performance, implying that corporate investments in environmental protection do not have any clear effect on its financial performance. Nordahl and Sultan (2008) examined the relationship between corporate environmental performance and firm value on Nordic corporations. Their results suggested that corporations categorized as High Emitters and High Emitters Minus show a neutral relationship between environmental performance and firm value, while corporations categorized as Low Emitters and Low Emitters Plus show a positive and significant relationship between environmental performance and firm value. The authors argued that value stems from possible cash flows created by low emitters, by viewing climate changes as a core risk, and that high emitters have limited possibilities to transfer the non-core risk into a core risk. Furthermore, Johansson and Orre (2009) tested the relationship between corporate environmental

performance and corporate financial performance for Swedish listed corporations during 2004-2007. They found a positive relationship between environmental performance and financial performance, suggesting a higher correlation between environmental performance and Tobin's q than for environmental performance and ROE. The results indicated that environmental performance indirectly and positively affects the market value of environmentally responsible corporations. Finally, Bakos (2009) studied the relationship between corporate social performance and corporate financial performance for Swedish listed corporations during 2006-2008. He examined the relationship between social performance and market value, as well as profitability through measures such as price-to-book (P/B) and ROE. His results suggested that there is no correlation between social performance and the market value of a corporation, expressed as P/B. However, he found a positive and significant relationship between social performance and the profitability of a corporation measured by ROE.

3.4.2 Market-based research

Hall and Rieck (1998) conducted a market-based study, examining the effects of voluntary CSR activities on shareholder wealth by performing an event analysis. The study found that the announcement of corporate donations had a positive and significant effect on stock prices. Corporations that produce environment-friendly products exhibit a large positive and significant reaction on day 0, but experience no significant returns over a cumulative time period. No other announcement of a voluntary CSR action had a significant effect on shareholder wealth. Thus, the results of the study suggested that socially responsible activities can enhance the market value of corporations, but that different types for CSR activities may have different effects on a corporation's market value. Scholtens (2008) studied the trade-off between stock market performance and social performance during 1991-2004. The results indicated support for a positive and significant relationship between financial and social performance, suggesting that financial performance precedes social performance, while different parameters of CSR, such as employee relations and community involvement, do not have the same relationship with financial return and risk. These results support the hypothesis

that good financial performance makes funds available that can be used to make investments that improve environmental and social performance of the corporation, instead of good environmental and social performance resulting in good financial performance. Ioannou and Serafeim (2010) tested the relationship between CSR and value creation in stock markets by examining analyst recommendations on U.S. corporations over 16 years. The results indicated that in earlier periods, CSR strategies were perceived as value-destructing and had a negative effect on investment recommendations, while in later periods, CSR strengths are perceived as value-creating, leading to positive effects on investment recommendations. They found that analysts are likely to recommend a stock "buy" for corporations with CSR strengths, and that higher visibility corporations are more likely to receive favourable recommendations when implementing CSR strategies.

Fiori, Donato and Izzo (2008) examined the relationship between voluntary CSR reports and stock prices during 2002-2007 for Italian listed corporations that prepare CSR reports on a regular basis. The results suggested that there is a positive and significant relationship between a good CSR disclosure regarding the employees and increases in stock prices, which the authors attribute to the strong bargaining power of trade unions in Italy and because Italian investors view good employee relations as a positive investment for future growth. The study showed a negative relationship between good CSR disclosure about the environment and community relations with stock prices, consistent with the authors' argument that investors pay attention to short-term profits and view commitments to the environment and community as costly. Brammer, Brooks and Pavelin (2009) considered the stock performance of the 100 Best Corporate Citizens of America, by examining short-term announcement effects around the publication of the annual survey Best 100 Corporate Citizens, published by Business Ethics, as well as examining whether longer-term returns are higher for corporations listed as good corporate citizens. The results suggested that corporations included in the Top 100 generate small but positive cumulative abnormal returns in a 21-day trading window around the announcement of the survey results. Furthermore, corporations newly listed as good citizens and corporations in the Top 100 that are outside the S&P 500 generate positive abnormal returns to investors. In the longer term, however, corporations in the Top 100 generate negative abnormal annual

returns of 3% below those of the S&P 500. Cheung (2010) analyzed the effects on stock return, risk and liquidity of sustainable corporations in the U.S. when they were added to or deleted from the Dow Jones Sustainability World Index during the period 2002-2008. The study could not conclude that the event announcement had a significant effect on stock returns. The results suggested, however, that there were temporary and significant effects on the day of change, or the days nearby, as Dow Jones inclusion stocks generated higher stock returns, while Dow Jones exclusion stocks generated lower stock returns. Celliera & Cholleta (2010) studied the relationship between CSR rating and financial performance, by measuring the impact of Vigeo corporate social rating announcements during 2004-2009 on short-term stock returns. The results suggested that CSR rating announcements have an overall positive and significant impact on the stock market, showing a positive and significant effect of the announcement on stock returns over two days prior and two days following an announcement. However, the stock prices reacted differently according to the different components of CSR.

4 Empirical findings

4.1 Descriptive statistics

In a similar fashion to that of Fiori et al. (2008), we begin by discussing the descriptive statistics, which are included in Table 1 in the Appendix. In the table, the mean values, standard deviations and the medians for the three CSR parameters are included. Also included in the table are Jarque-Bera probabilities. When viewing the descriptive statistics, we can decide if and how the CSR reporting in annual reports has developed during the analyzed time period. We stated earlier in the text that the time period for ranking CSR reporting in annual reports was during 2004-2008. When analyzing the descriptive statistics, we find a positive development in the CSR reporting for all three CSR parameters, as they all record progressive increases during the whole time period, even though the increases were relatively small.

4.2 Replicating regression

In the replicating regression, we replicate the precise method used by Fiori et al. (2008). The results from this regression can be found in Table 2 in the Appendix. In this model, significant control variables are total assets, return on equity, and the constant. Total assets are negatively and significantly correlated to stock prices, with a p-value of 0.0012. However, even though total assets show significant correlation with stock prices, they have a standard deviation of 0.000136, which is very low. Return on equity is positively and significantly correlated to stock prices and has a p-value of 0.0022. Finally, the constant is positively and significantly correlated to stock prices, showing a p-value of 0.0033. The model shows no significance between any of the three CSR parameters and stock prices. The adjusted R-squared is 0.153, and the F-statistic shows significance. In Table 3 we conduct White's Heteroskedasticity Test with

squared residuals and in Table 4 we conduct White's Heteroskedasticity Test with cross-terms. The two tests show that there is no Heteroskedasticity in the regression model, since the F-statistics are not significant. Furthermore, in Table 5, we conduct the regression adjusted for Heteroskedasticity, using White Heteroskedasticity-Consistent Standard Errors and Covariance. Compared to the results in Table 2, the coefficients remain unchanged, and standard errors display modest changes, which reinforces the earlier results showing that there is no Heteroskedasticity. In the absence of Heteroskedasticity, we continue by using the model from Table 2. We conduct Ramsey's Reset Test in Table 6, which shows that the model has specification errors. The fitted values show significance at the fourth degree. We then check for multicollinearity in Table 7. Since no values exceed 0.8, multicollinearity should not be an issue. Moreover, in Table 8, we check for normal distribution in all the variables, as well as in the model's residuals. While the variables in the model are not normally distributed, we find that the model's residuals are normally distributed. Finally, in order to take into consideration the aspect of time, we conduct the Box-Ljung Q-statistics to test for autocorrelation. The test shows that there is no autocorrelation in the model.

4.3 Alternative replicating regression

In this model, we replicate the original regression model used by Fiori et al., but we measure financial performance by stock returns, rather than stock prices in real terms. When viewing Table 10, we find that this model has no variables showing significance in relation to stock returns. Also, the adjusted R-squared is negative, and the F-statistic shows that the model is not significant. Because of these results, we do not carry on with the model. After seeing these bad results, we can conclude that Fiori et al. (2008) have performed the study in Table 2, which we initially replicated.

4.4 Proposed adjustments to the replicating regression

In contrast to previous models, in this model we use risk adjusted returns as an indicator of financial performance, and we also use the change in social performance, measured in terms of CSR reporting. In addition, we exclude the beta value as a controlling variable as it used to compute the risk adjusted returns, and we use natural logarithm total assets. In Table 11, debt/equity shows a positive and significant relation to the risk adjusted returns, with a p-value of 0.0009. In this model, as in previous models, none of the three CSR parameters show a significant relation to risk adjusted returns. Furthermore, the adjusted R-squared is very low, showing a value of only 0.055. The F-statistic shows that the model is significant, with a p-value of 0.008. In Table 12, we conduct White's Heteroskedasticity Test with squared residuals. The p-value of the model is not significant, indicating that there is no Heteroskedasticity. We continue in Table 13 by conducting White's Heteroskedasticity Test with cross-terms. The F-statistic shows a significant p-value of 0.001, which means that there is Heteroskedasticity in the model. Therefore, in Table 14 we adjust for the Heteroskedasticity by using White Heteroskedasticity-Consistent Standard Errors and Covariance. Even after adjusting for Heteroskedasticity, we find that only debt/equity is significantly related to risk adjusted returns, with a p-value of 0.0227. Moreover, in Table 15 we conduct Ramsey's Reset Test, where we find that the fitted values are significant already in the second degree. Thereafter, we test for multicollinearity in Table 16. We do not find any multicollinearity in this model. Furthermore, in Table 17, we test for normal distribution for all the variables, as well as for the model's residuals. We cannot find a normal distribution. Lastly, we use the Box-Ljung Q-statistics to test for autocorrelation, and find that the test shows autocorrelation at lag one.

5 Analysis

5.1 The relationship between CSP and CFP

During recent decades, the role of CSR has been widely highlighted and debated. In a time where corporations are increasingly globalized and powerful, public demands for CSR have intensified and corporations are pressured to act socially responsibly, with a view to contributing to a sustainable development. Although corporate commitments to CSR are voluntary, a rising trend is that corporations devote attention to CSR, mainly through the establishment of internal codes of conduct and preparations of CSR reporting in their annual reports. The descriptive statistics in this study support this view, by showing a progressive development in the CSR reporting of corporations in our sample during the whole period comprising 2004-2008. However, the issue of CSR still seems to be problematic, as corporations face trade-offs between satisfying their shareholders on the one hand, and satisfying their relevant stakeholders on the other. In CSR debates, stakeholder and shareholder theory provide competing views on whether or not corporations should engage in CSR or solely focus on maximizing shareholder wealth. Proponents of the shareholder approach argue that the main goal of a corporation is to maximize profits in order to create shareholder wealth, whereas proponents of the stakeholder theory argue that a corporation must take into account the views and interests of all its relevant stakeholders if they are to be successful, by engaging in CSR. Disagreements on the theoretical domain have been largely accompanied on the practical domain. Researchers have been struggling to agree on a consistent definition of CSR and to establish a coherent system of measuring the relationship between corporate social and corporate financial performance. These problems have led to inconsistent empirical results.

This study is an attempt to contribute to the scattered field of research on the relationship between corporate social and financial performance. It attempts to complement previous accounting-based CSR studies performed on the Nordic market by contributing with a market-based study that examines the potential

effect of voluntary CSR reporting in annual reports on the stock prices of corporations listed on the OMX Nordic Exchange. As Fiori et al. (2008) argue that the potential effects of CSR on stock prices will differ across countries with different cultures, institutional environments and stakeholder expectations, we replicate their study in order to compare how the effects of CSR reporting on the stock prices of Nordic listed corporations may differ from that of CSR reporting on Italian listed corporations. It appears as though there are some differences in the effects of CSR reporting on the stock prices of Italian listed and Nordic listed corporations. In line with their hypothesis that investors perceive investments in employees as positive and investments in the environment and community involvement as negative, Fiori et al. (2008) find that in Italy, CSR disclosure regarding the employees has a positive and significant effect on stock prices, while the CSR disclosure regarding the environment and community involvement has a negative effect on stock prices. When replicating their model, we find a neutral relationship between the three different CSR parameters and stock prices, suggesting that CSR disclosure relating to employees, the environment and community involvement have no effect on the stock prices of Nordic listed corporations. Thus, this market-based study brings new insights into the relationship between social and financial performance, by providing empirical evidence that for corporations listed on the OMX Nordic Exchange, disclosure of CSR activities in annual reports has no effect on stock prices. Hence, it supports shareholder theory, which would indicate two things: 1) investors on the Nordic market do not care enough about CSR for it to display a positive effect on stock prices; and 2) the Nordic market is a very capitalistic and competitive market, which limits corporate engagement in CSR in order for corporations not to lose competitive advantage.

For a better overview of the relationship between corporate social and financial performance, within as well as beyond the Nordic market, both the results received by Fiori et al. (2008) and our results need to be compared to previous research that is both accounting-based as well as market-based. The results received by Fiori et al. (2008) are supported by Scholtens (2008), Celliear and Cholleta (2010), and Hall and Rieck (1998). These researchers all found that the financial performance of corporations, whether it is measured through an accounting-based or a market-based approach, is affected differently by the

disclosure related to different CSR activities. Meanwhile, our results, showing a neutral relationship, are supported by Bakos (2009), who found a neutral relationship between social performance and market valuation on the Swedish market, and Carlsson (2006) who found a neutral relationship between environmental performance and market valuation measured by Tobin's q on the Scandinavian market. Beyond these studies, research has shown both positive and negative relations between social and financial performance. Johansson and Orre (2009) and Nordahl and Sultan (2008) found a positive relationship between environmental and financial performance on the Swedish and the Nordic market, respectively. Furthermore, Brammer, Brooks and Pavelin (2009) found a positive relationship between corporations listed as good corporate citizens and stock returns in the short term, and a negative relationship in the longer term.

As can be seen in the body of research outlined above, there are results that both support and contradict our results, showing on the one hand that there is no relationship between social and financial performance, and showing that a good social performance can be value creating, on the other. Thus, there is support of both the shareholder and the stakeholder approach to CSR, which indicates that there is no perfect answer to the question as to whether or not a corporation can or should engage in CSR. In other words, there does not seem to be a "one-size-fits-all" answer regarding the relationship between social and financial performance. While we do believe that CSR has gained momentum during recent decades, we consider CSR to be a complicated topic. The mix between positive, neutral, and negative results goes to show that the relationship between social and financial performance is not yet clear, and that, ultimately, it depends on how it is measured.

5.2 Methodological limitations

The consistent prevalence of inconsistent empirical results on the presumed relationship between social and financial performance confirms the existence of ambiguity in terms of measurement. Among the problems connected to measurement is the question of causality between social and financial

performance. Does good social performance lead to good financial performance, or is it the other way around? Scholtens (2008) found that instead of good social performance leading to a solid financial performance, it was the case that good financial performance made investments in CSR activities possible and, thus, preceded social performance. This fundamental limitation, in combination with the lack of a consistent theoretical framework regarding the relationship between social and financial performance, causes problems of measurement as well as interpretation of empirical results. When replicating Fiori et al.'s (2008) research method, we do not end up with satisfying models. The model providing the best adjusted R-squared is the first replicating regression. However, this adjusted R-squared is still at a very low level. Furthermore, the model is susceptible to specification errors and only one control variable is significant. We try to reduce these limitations by adjusting the model, first by transforming stock prices to returns, and then by adjusting returns for risk, in combination with other changes. Unfortunately, however, even though some important aspects of the model are improved as a result of our adjustments, other parts of the model bring down the validity. After testing for several adjustments, we reach the conclusion that it is difficult to measure the impact of CSR reporting on stock prices for corporations listed on the OMX Nordic Exchange, when using the method of Fiori et al. (2008). So, while stock price is generally considered to be among the best measurements of corporate profitability and success, there does not seem to be an equivalent measure for determining successful social performance. This difficulty in deciding how to coherently measure the relationship between social and financial performance leaves us doubtful as to whether there is valid evidence of such a relationship.

6 Conclusions

In an attempt to contribute to earlier research focusing on CSR on the Nordic market, we have conducted a market-based study on the relationship between corporate social and financial performance. More specifically, we have replicated a study conducted by Fiori et al. (2008). They measured the effects of voluntary CSR reporting on the stock prices of Italian listed corporations, and argued that different results may be obtained in different cultural settings. In order to test how their results compare to that of corporations listed on the Nordic market, we examined the effects of voluntary CSR reporting on the stock prices of corporations listed on the OMX Nordic Exchange. The differences turned out to be quite substantial. While their results showed a positive relation between CSR reporting related to employees and stock prices, and a negative relation between CSR reporting related to the environment and community involvement and stock prices, we found a neutral relationship between all three CSR parameters and stock prices for the corporations listed on the OMX Nordic Exchange. These results indicate that investors in the Nordic market are not very excited about socially responsible activities, since they are not mirrored in stock prices. Furthermore, we found that empirical results for international research examining the relationship between social and financial performance are scattered, showing positive, neutral, and negative relationships. One fundamental reason for this seemed to be the lack of a consistent theoretical framework regarding the relationship between social and financial performance, which leads to difficulties in measuring the relationship and interpreting the results. This problem was inherent in our study, too, and yielded an unsatisfactory research model. Finally, we conclude that there does not seem to be any good indicator of social performance. Because of this, we are skeptical to the possibility of measuring the presumed relationship between social and financial performance, and trusting the results stemming from such research.

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8 Appendix

Table 1 Descriptive statistics

Year	2004			2005			2006			2007			2008		
CSR-Parameter	Emp	Env	Com	Emp	Env	Com	Emp	Env	Com	Emp	Env	Com	Emp	Env	Com
Mean	8,85	8,17	1,95	9,12	8,27	1,93	8,62	8,17	2,14	9,12	8,88	2,07	9,86	9,76	2,31
Median	10,00	10,00	2,00	10,00	10,00	2,00	9,00	10,00	2,00	10,00	12,00	2,00	11,00	12,00	3,00
Std. Dev.	3,91	4,40	1,20	4,06	4,46	1,19	3,80	4,53	1,07	3,96	4,22	1,03	3,78	3,81	1,05
Skewness	-0,68	-0,82	-0,78	-0,71	-0,83	-0,76	-0,53	-0,81	-1,13	-0,42	-1,06	-1,06	-0,68	-1,49	-1,42
Kurtosis	2,81	2,18	2,04	2,72	2,17	2,04	2,66	2,11	2,99	2,19	2,62	3,03	2,36	3,69	3,66
Jarque-Bera	3,20	5,77	5,71	3,58	5,92	5,48	2,15	5,95	8,90	2,42	8,24	8,03	3,96	16,31	14,85
Probability	0,20	0,06	0,06	0,17	0,05	0,06	0,34	0,05	0,01	0,30	0,02	0,02	0,14	0,00	0,00
Observations	41	41	41	41	41	41	42	42	42	43	43	43	42	42	42

Table 2 OLS Regression

Dependent Variable: SP
Method: Least Squares
Included observations: 208

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	2.245790	1.742194	1.289059	0.1989
U_ENV	2.547882	1.398278	1.822158	0.0699
U_COM	0.774696	1.013343	0.764495	0.4455
TA	-0.000448	0.000136	-3.297120	0.0012
ROE	15.78271	5.086950	3.102589	0.0022
DE	-1.063894	0.568471	-1.871501	0.0627
B	-1.536844	1.713687	-0.896805	0.3709
C	10.98609	3.692134	2.975539	0.0033

R-squared	0.181220	Mean dependent var	17.82297
Adjusted R-squared	0.152562	S.D. dependent var	15.55318
S.E. of regression	14.31769	Akaike info criterion	8.198571
Sum squared resid	40999.25	Schwarz criterion	8.326938
Log likelihood	-844.6514	Hannan-Quinn criter.	8.250476
F-statistic	6.323683	Durbin-Watson stat	0.730334
Prob(F-statistic)	0.000001		

Table 3 White's heteroscedasticity test, squared residuals

Heteroskedasticity Test: White

F-statistic	1.464134	Prob. F(7,200)	0.1819
Obs*R-squared	10.13931	Prob. Chi-Square(7)	0.1808
Scaled explained SS	24.12608	Prob. Chi-Square(7)	0.0011

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Included observations: 208

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	163.0472	79.14575	2.060088	0.0407
U_EMP^2	5.992020	16.14912	0.371043	0.7110
U_ENV^2	-4.347796	12.21953	-0.355807	0.7224
U_COM^2	20.40079	10.26563	1.987291	0.0483
TA^2	-2.31E-07	1.30E-07	-1.780704	0.0765
ROE^2	-149.1294	313.6423	-0.475476	0.6350
DE^2	-0.178381	1.052333	-0.169510	0.8656
B^2	-21.41548	15.84916	-1.351206	0.1782

R-squared	0.048747	Mean dependent var	197.1118
Adjusted R-squared	0.015453	S.D. dependent var	448.2771
S.E. of regression	444.8000	Akaike info criterion	15.07083
Sum squared resid	39569415	Schwarz criterion	15.19920
Log likelihood	-1559.366	Hannan-Quinn criter.	15.12273
F-statistic	1.464134	Durbin-Watson stat	1.237281
Prob(F-statistic)	0.181933		

Table 4 whites heteroscedasticity test, cross-terms

Heteroskedasticity Test: White

F-statistic	1.063425	Prob. F(35,172)	0.3846
Obs*R-squared	37.00287	Prob. Chi-Square(35)	0.3766
Scaled explained SS	88.04682	Prob. Chi-Square(35)	0.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Included observations: 208

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	216.0658	452.4569	0.477539	0.6336
U_EMP	-580.4669	328.5777	-1.766605	0.0791
U_EMP^2	108.9481	82.73325	1.316859	0.1896
U_EMP*U_ENV	-37.14167	87.11472	-0.426354	0.6704
U_EMP*U_COM	160.1225	66.64557	2.402597	0.0173
U_EMP*TA	-0.024841	0.010531	-2.358762	0.0195
U_EMP*ROE	184.0326	426.2170	0.431781	0.6664
U_EMP*DE	-59.37324	65.04306	-0.912830	0.3626
U_EMP*B	144.2180	130.8920	1.101809	0.2721
U_ENV	430.5534	249.3264	1.726866	0.0860
U_ENV^2	-73.46432	57.17464	-1.284911	0.2006
U_ENV*U_COM	-37.46275	54.19324	-0.691281	0.4903
U_ENV*TA	0.000772	0.012543	0.061588	0.9510
U_ENV*ROE	-219.1946	335.0684	-0.654179	0.5139
U_ENV*DE	43.85754	56.36365	0.778117	0.4376
U_ENV*B	-71.81752	102.2156	-0.702608	0.4832
U_COM	-5.445112	178.8231	-0.030450	0.9757
U_COM^2	-21.90721	41.93850	-0.522365	0.6021
U_COM*TA	-0.000504	0.009901	-0.050948	0.9594
U_COM*ROE	-130.9067	238.6218	-0.548595	0.5840
U_COM*DE	-6.353285	34.60991	-0.183568	0.8546
U_COM*B	-9.052167	85.35420	-0.106054	0.9157
TA	0.034977	0.037554	0.931385	0.3530
TA^2	5.56E-07	5.80E-07	0.958973	0.3389
TA*ROE	-0.011008	0.033042	-0.333145	0.7394
TA*DE	0.002235	0.005753	0.388470	0.6981
TA*B	-0.006354	0.012804	-0.496266	0.6203
ROE	154.6342	1012.848	0.152673	0.8788
ROE^2	-191.5351	840.9729	-0.227754	0.8201
ROE*DE	-12.31428	201.4844	-0.061118	0.9513
ROE*B	418.2952	474.5060	0.881538	0.3793
DE	167.9722	126.7310	1.325424	0.1868
DE^2	2.376442	11.74686	0.202304	0.8399
DE*B	-128.2759	85.76115	-1.495734	0.1366
B	-116.1953	354.9717	-0.327337	0.7438
B^2	41.05875	82.03749	0.500488	0.6174

R-squared	0.177898	Mean dependent var	197.1118
Adjusted R-squared	0.010610	S.D. dependent var	448.2771
S.E. of regression	445.8926	Akaike info criterion	15.19414
Sum squared resid	34197073	Schwarz criterion	15.77179
Log likelihood	-1544.191	Hannan-Quinn criter.	15.42772
F-statistic	1.063425	Durbin-Watson stat	1.489815
Prob(F-statistic)	0.384647		

Table 5 Heteroscedasticity adjusted regression

Dependent Variable: SP
Method: Least Squares
Included observations: 208
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	2.245790	1.804529	1.244530	0.2148
U_ENV	2.547882	1.089894	2.337735	0.0204
U_COM	0.774696	0.772188	1.003248	0.3170
TA	-0.000448	0.000111	-4.025734	0.0001
ROE	15.78271	3.660635	4.311469	0.0000
DE	-1.063894	0.257889	-4.125399	0.0001
B	-1.536844	1.605078	-0.957489	0.3395
C	10.98609	3.687206	2.979516	0.0032

R-squared	0.181220	Mean dependent var	17.82297
Adjusted R-squared	0.152562	S.D. dependent var	15.55318
S.E. of regression	14.31769	Akaike info criterion	8.198571
Sum squared resid	40999.25	Schwarz criterion	8.326938
Log likelihood	-844.6514	Hannan-Quinn criter.	8.250476
F-statistic	6.323683	Durbin-Watson stat	0.730334
Prob(F-statistic)	0.000001		

Table 6 Ramsey RESET test

Ramsey RESET Test
Specification: SP U_EMP U_ENV U_COM TA ROE DE B C
Omitted Variables: Powers of fitted values from 2 to 4

	Value	df	Probability
F-statistic	5.967364	(3, 197)	0.0006
Likelihood ratio	18.09159	3	0.0004

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	3415.380	3	1138.460
Restricted SSR	40999.25	200	204.9963
Unrestricted SSR	37583.87	197	190.7811
Unrestricted SSR	37583.87	197	190.7811

LR test summary:

	Value	df
Restricted LogL	-844.6514	200
Unrestricted LogL	-835.6056	197

Unrestricted Test Equation:
Dependent Variable: SP
Method: Least Squares
Included observations: 208

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	3.856312	2.450835	1.573469	0.1172
U_ENV	4.753292	2.722368	1.746014	0.0824
U_COM	0.197985	1.103937	0.179344	0.8579
TA	-0.000724	0.000409	-1.768689	0.0785
ROE	26.33882	11.03087	2.387737	0.0179
DE	-1.707061	0.808184	-2.112219	0.0359
B	-1.980774	2.082577	-0.951117	0.3427
C	17.14924	6.493937	2.640808	0.0089
FITTED^2	0.050538	0.068386	0.739012	0.4608
FITTED^3	-0.011209	0.005971	-1.877104	0.0620
FITTED^4	0.000331	0.000137	2.413903	0.0167

R-squared	0.249427	Mean dependent var	17.82297
Adjusted R-squared	0.211327	S.D. dependent var	15.55318
S.E. of regression	13.81235	Akaike info criterion	8.140438
Sum squared resid	37583.87	Schwarz criterion	8.316943
Log likelihood	-835.6056	Hannan-Quinn criter.	8.211808
F-statistic	6.546614	Durbin-Watson stat	0.838896
Prob(F-statistic)	0.000000		

Table 7 Multicollinearity

	U_EMP	U_ENV	U_COM
U_EMP	1,00	0,65	0,33
U_ENV	0,65	1,00	0,43
U_COM	0,33	0,43	1,00

Table 8 Jarque-Bera Normality test

	U_EMP	U_ENV	U_COM	TA	ROE	DE	B	SP	Resid
Mean	1,82	2,16	2,08	7094,82	0,16	1,75	1,19	17,82	0,00
Median	2,00	2,75	2,00	3897,95	0,18	1,42	1,18	13,35	0,01
Maximum	3,00	3,00	3,00	39582,00	1,05	23,47	4,15	78,06	1,63
Minimum	0,00	0,00	0,00	26,94	-1,08	0,16	-0,11	0,02	-1,67
Std, Dev,	0,78	1,08	1,11	8378,57	0,20	1,85	0,61	15,55	0,57
Skewness	-0,59	-0,98	-1,00	1,79	-1,40	8,05	1,10	1,68	-0,05
Kurtosis	2,53	2,43	2,61	5,73	12,68	92,19	7,05	5,80	3,25
Jarque-Bera	13,95	35,89	36,22	175,35	880,45	71189,33	184,51	165,55	0,66
Probability	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,72
Observations	208	208	208	208	208	208	208	208	208

Table 9 Box-Ljung Q-statistics

Included observations: 208

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		**1**	0.628	0.628	83.333	0.000
		2	0.474	0.130	130.95	0.000
		3	0.377	0.061	161.26	0.000
		4	0.337	0.084	185.65	0.000
		5	0.372	0.167	215.45	0.000
		6	0.264	-0.108	230.47	0.000
		7	0.230	0.030	242.00	0.000
		8	0.210	0.034	251.61	0.000
		9	0.192	0.010	259.67	0.000
		10	0.202	0.033	268.69	0.000
		11	0.135	-0.052	272.74	0.000
		12	0.075	-0.071	274.00	0.000
		13	0.011	-0.082	274.03	0.000
		14	0.053	0.098	274.66	0.000
		15	0.093	0.052	276.64	0.000
		16	0.032	-0.089	276.87	0.000
		17	-0.001	-0.019	276.87	0.000
		18	0.056	0.153	277.60	0.000
		19	0.046	-0.065	278.10	0.000
		20	0.045	-0.023	278.58	0.000

Table 10 OLS Regression

Dependent Variable: R
Method: Least Squares
Included observations: 208

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	0.120276	2.366022	0.050835	0.9595
U_ENV	-0.362318	1.898960	-0.190798	0.8489
U_COM	-0.023972	1.376192	-0.017419	0.9861
TA	-5.30E-05	0.000185	-0.286942	0.7745
ROE	2.098934	6.908437	0.303822	0.7616
DE	-0.182652	0.772024	-0.236589	0.8132
B	0.094107	2.327309	0.040436	0.9678
C	1.768641	5.014179	0.352728	0.7247

R-squared	0.001624	Mean dependent var	0.901417
Adjusted R-squared	-0.033319	S.D. dependent var	19.12837
S.E. of regression	19.44444	Akaike info criterion	8.810701
Sum squared resid	75617.21	Schwarz criterion	8.939068
Log likelihood	-908.3129	Hannan-Quinn criter.	8.862606
F-statistic	0.046468	Durbin-Watson stat	2.794051
Prob(F-statistic)	0.999863		

Table 11 OLS regression

Dependent Variable: RAR
Method: Least Squares
Included observations: 205

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	-0.071572	0.092580	-0.773087	0.4404
U_ENV	0.093959	0.158487	0.592853	0.5540
U_COM	-0.012887	0.145458	-0.088596	0.9295
LOG(TA)	-0.015297	0.030914	-0.494826	0.6213
ROE	0.404956	0.213037	1.900873	0.0588
DE	0.076006	0.022503	3.377669	0.0009
C	0.234161	0.253662	0.923125	0.3571

R-squared	0.082953	Mean dependent var	0.301065
Adjusted R-squared	0.055163	S.D. dependent var	0.606490
S.E. of regression	0.589525	Akaike info criterion	1.814551
Sum squared resid	68.81287	Schwarz criterion	1.928019
Log likelihood	-178.9914	Hannan-Quinn criter.	1.860446
F-statistic	2.985052	Durbin-Watson stat	1.967535
Prob(F-statistic)	0.008185		

Table 12 Whites Heteroscedasticity test, squared residuals

Heteroskedasticity Test: White

F-statistic	1.794476	Prob. F(6,198)	0.1019
Obs*R-squared	10.57258	Prob. Chi-Square(6)	0.1025
Scaled explained SS	12.81050	Prob. Chi-Square(6)	0.0461

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Included observations: 205

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.656695	0.140040	4.689342	0.0000
U_EMP^2	-0.021698	0.030837	-0.703639	0.4825
U_ENV^2	0.143384	0.142218	1.008199	0.3146
U_COM^2	-0.060300	0.163240	-0.369397	0.7122
(LOG(TA))^2	-0.004470	0.001837	-2.433640	0.0158
ROE^2	-0.540271	0.387955	-1.392612	0.1653
DE^2	0.002609	0.001270	2.054747	0.0412

R-squared	0.051574	Mean dependent var	0.335673
Adjusted R-squared	0.022833	S.D. dependent var	0.542343
S.E. of regression	0.536115	Akaike info criterion	1.624614
Sum squared resid	56.90904	Schwarz criterion	1.738083
Log likelihood	-159.5229	Hannan-Quinn criter.	1.670509
F-statistic	1.794476	Durbin-Watson stat	1.750106
Prob(F-statistic)	0.101926		

Table 13 White´s Heteroscedasticity test, cross-terms

Heteroskedasticity Test: White

F-statistic	2.203158	Prob. F(27,177)	0.0012
Obs*R-squared	51.56550	Prob. Chi-Square(27)	0.0030
Scaled explained SS	62.48043	Prob. Chi-Square(27)	0.0001

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Included observations: 205

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.270658	1.140995	-0.237212	0.8128
U_EMP	-1.982295	0.899007	-2.204982	0.0287
U_EMP^2	-0.033535	0.074540	-0.449893	0.6533
U_EMP*U_ENV	0.927046	0.455876	2.033550	0.0435
U_EMP*U_COM	-0.483301	0.349632	-1.382312	0.1686
U_EMP*(LOG(TA))	0.182610	0.095939	1.903403	0.0586
U_EMP*ROE	1.174246	0.759887	1.545290	0.1241
U_EMP*DE	0.039401	0.147857	0.266482	0.7902
U_ENV	1.580207	1.252535	1.261607	0.2088
U_ENV^2	-0.221856	0.208108	-1.066064	0.2878
U_ENV*U_COM	0.309468	0.438627	0.705538	0.4814
U_ENV*(LOG(TA))	-0.222876	0.142187	-1.567485	0.1188
U_ENV*ROE	1.735125	0.909988	1.906755	0.0582
U_ENV*DE	0.126295	0.169222	0.746327	0.4565
U_COM	-1.125342	1.145322	-0.982556	0.3272
U_COM^2	-0.144611	0.225323	-0.641795	0.5218
U_COM*(LOG(TA))	0.138014	0.123395	1.118472	0.2649
U_COM*ROE	-0.153828	1.021666	-0.150566	0.8805
U_COM*DE	-0.064359	0.165213	-0.389550	0.6973
LOG(TA)	0.114246	0.282436	0.404501	0.6863
(LOG(TA))^2	-0.006953	0.017687	-0.393130	0.6947
(LOG(TA))*ROE	-0.036890	0.155084	-0.237873	0.8123
(LOG(TA))*DE	-0.037119	0.030971	-1.198509	0.2323
ROE	-0.068220	1.364561	-0.049994	0.9602
ROE^2	-0.935550	0.857334	-1.091231	0.2767
ROE*DE	0.236038	0.184167	1.281646	0.2016
DE	0.450862	0.250545	1.799527	0.0736
DE^2	-0.011575	0.008782	-1.318075	0.1892

R-squared	0.251539	Mean dependent var	0.335673
Adjusted R-squared	0.137367	S.D. dependent var	0.542343
S.E. of regression	0.503717	Akaike info criterion	1.592707
Sum squared resid	44.91039	Schwarz criterion	2.046581
Log likelihood	-135.2525	Hannan-Quinn criter.	1.776288
F-statistic	2.203158	Durbin-Watson stat	1.797510
Prob(F-statistic)	0.001223		

Table 14 Heteroscedasticity adjusted regression

Dependent Variable: RAR
Method: Least Squares
Included observations: 205
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	-0.071572	0.065128	-1.098949	0.2731
U_ENV	0.093959	0.165025	0.569363	0.5698
U_COM	-0.012887	0.130010	-0.099124	0.9211
LOG(TA)	-0.015297	0.032658	-0.468405	0.6400
ROE	0.404956	0.205542	1.970185	0.0502
DE	0.076006	0.033109	2.295628	0.0227
C	0.234161	0.283171	0.826925	0.4093

R-squared	0.082953	Mean dependent var	0.301065
Adjusted R-squared	0.055163	S.D. dependent var	0.606490
S.E. of regression	0.589525	Akaike info criterion	1.814551
Sum squared resid	68.81287	Schwarz criterion	1.928019
Log likelihood	-178.9914	Hannan-Quinn criter.	1.860446
F-statistic	2.985052	Durbin-Watson stat	1.967535
Prob(F-statistic)	0.008185		

Table 15 Ramsey RESET Test

Ramsey RESET Test
Specification: RAR U_EMP U_ENV U_COM LOG(TA) ROE DE C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	2.952980	197	0.0035
F-statistic	8.720091	(1, 197)	0.0035
Likelihood ratio	8.879111	1	0.0029

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	2.916849	1	2.916849
Restricted SSR	68.81287	198	0.347540
Unrestricted SSR	65.89602	197	0.334498
Unrestricted SSR	65.89602	197	0.334498

LR test summary:

	Value	df
Restricted LogL	-178.9914	198
Unrestricted LogL	-174.5519	197

Unrestricted Test Equation:
Dependent Variable: RAR
Method: Least Squares
Included observations: 205
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
U_EMP	-0.043518	0.066429	-0.655108	0.5132
U_ENV	0.038088	0.169161	0.225159	0.8221
U_COM	-0.021502	0.130240	-0.165097	0.8690
LOG(TA)	-0.007894	0.031795	-0.248284	0.8042
ROE	-0.043370	0.246543	-0.175913	0.8605
DE	-0.065595	0.053644	-1.222779	0.2229
C	0.386116	0.273147	1.413583	0.1591
FITTED^2	0.854698	0.260060	3.286543	0.0012

R-squared	0.121824	Mean dependent var	0.301065
Adjusted R-squared	0.090620	S.D. dependent var	0.606490
S.E. of regression	0.578358	Akaike info criterion	1.780994
Sum squared resid	65.89602	Schwarz criterion	1.910672
Log likelihood	-174.5519	Hannan-Quinn criter.	1.833446
F-statistic	3.904104	Durbin-Watson stat	1.975963
Prob(F-statistic)	0.000522		

Table 16 Multicollinearity

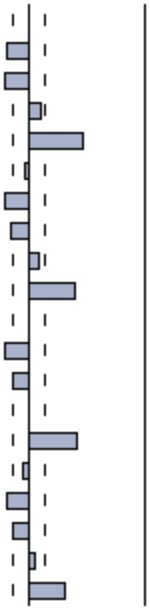
	U_EMP	U_ENV	U_COM
U_EMP	1,00	0,36	0,13
U_ENV	0,36	1,00	0,33
U_COM	0,13	0,33	1,00

Table 17 Jarque-Bera Normality test

	U_EMP	U_ENV	U_COM	logTA	ROE	DE	RAR	Resid
Mean	0,11	0,03	-0,01	8,14	0,16	1,74	0,30	0,00
Median	0,00	0,00	0,00	8,27	0,17	1,41	0,26	-0,03
Maximum	3,50	1,67	0,50	10,59	1,05	23,47	3,28	1,81
Minimum	-1,00	-1,00	-1,00	3,29	-1,08	0,16	-0,91	-1,49
Std. Dev.	0,48	0,30	0,30	1,39	0,20	1,86	0,61	0,58
Skewness	3,68	-0,41	-1,50	-0,62	-1,40	8,09	1,12	0,57
Kurtosis	26,37	11,17	7,57	3,47	13,30	92,50	5,69	3,60
Jarque-Bera	5127,31	575,75	255,30	15,15	973,11	70653,20	104,56	14,10
Probability	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Observations	205	205	205	205	205	205	205	205

Table 18 Box-Ljung Q-statistics

Included observations: 205

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.006	0.006	0.0066	0.935
		2	-0.202	-0.202	8.5535	0.014
		3	-0.207	-0.213	17.521	0.001
		4	0.109	0.067	20.013	0.000
		5	0.477	0.436	68.264	0.000
		6	-0.048	-0.036	68.749	0.000
		7	-0.214	-0.072	78.529	0.000
		8	-0.165	-0.056	84.389	0.000
		9	0.084	-0.059	85.899	0.000
		10	0.415	0.225	123.34	0.000
		11	0.001	0.087	123.34	0.000
		12	-0.216	-0.047	133.58	0.000
		13	-0.150	-0.027	138.54	0.000
		14	-0.002	-0.164	138.54	0.000
		15	0.436	0.198	180.93	0.000
		16	-0.060	-0.040	181.73	0.000
		17	-0.199	-0.011	190.71	0.000
		18	-0.151	-0.001	195.87	0.000
		19	0.050	-0.042	196.44	0.000
		20	0.330	-0.000	221.46	0.000