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„Corporate Social Responsibility and the Cost of Equity  
Capital: Do Capital Markets Reward CSR Performance  
of Firms?“

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“Economic analysis, by itself, cannot provide a torch that lights our way into the future, but economic vision could become the source of an awareness of ways by which a capitalist structure can broaden its motivations, increase its flexibility, and develop its social responsibility.”

(Robert Heilbroner, *The Worldly Philosophers*, 1999, pp. 320/321)



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## List of Abbreviations

ANOVA	Analysis of Variance
AuM	Asset under management
CAPM	Capital asset pricing model
CSR	Corporate social responsibility
DJGI	Dow Jones Global Index
DJSI	Dow Jones Sustainability Index
ESG	Environmental, social and governance
EU	European Union
ICC	Implied cost of capital
R&D	Research and development
ROA	Return on assets
ROE	Return on equity
SRI	Sustainable and responsible investment
U.S.	United States of America
UK	United Kingdom
WACC	Weighted average cost of capital



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# 1 Introduction

Corporate social responsibility (CSR) of firms and the concept of sustainable and responsible investment (SRI) have gained increased popularity over the last two decades. In the age of multimedia and communication, firms face higher costs of image losses. For example, the BP oil spill in the Gulf of Mexico from 2010 showed that social and environmental catastrophes lead to bigger and longer lasting damages. Furthermore, institutional investors treat SRI as a part of its risk management and thus, SRI assets held by institutional investors in Europe<sup>1</sup> doubled between 2007 and 2009. Interestingly, during the financial crisis of 2007, the reduction in assets under management (AuM) was lower for SRI than for traditional assets (Eurosif, 2010 and 2008). By the end of 2009, total AuM in the Europe made up EUR 12.8 trillion and SRI AuM EUR 5 trillion. In the United States (U.S.), SRI AuM experienced a remarkably growth of 380 percent between 1995 and 2009 as well. While total AuM in the U.S. were USD 25.2 trillion, SRI AuM accounted for USD 3.07 trillion. As a consequence to the financial crisis in 2007, total AuM decreased between 2007 and 2009, but SRI AuM could register a positive growth rate (US SIF, 2010).

Regarding financial reporting, the European Commission amended its Directive 78/660/EEC via Directive 2003/51/EC in June 2003 in order that companies “shall include both financial and, where appropriate, non-financial key performance indicators relevant to the particular business, including information relating to environmental and employee matters” (Art. 46 (a) 1. (b)). While in 1992 no company reported on environmental, social or governmental (ESG) issues in the European Union (EU), in 2009 around 2,000 European firms released a sustainability report. Interestingly, there have been around three times more CSR reports published by firms from the EU than from North and Central America (Wensen et al., 2011). In certain EU member states, such as Denmark or Sweden, sustainability reporting is already mandatory. Sustainability reporting, in form of mandatory integrated reports is required in certain EU member states, exempli gratia in France (Ioannou and Serafeim, 2010). In Germany and Austria, a management report (“Lagebericht”) needs to be enclosed to the annual report, including non-financial performance indicators about environmental and employee matters; a separate sustainability report is not required by law (see HGB §289 (3) and UGB §243 (5), respectively). Additionally, a corporate governance report

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<sup>1</sup>Austria, Belgium, France, Germany, Italy, Spain, Switzerland, Netherlands, United Kingdom, Denmark, Finland, Sweden and Norway.

## 1.1 Objective

is required for stock listed companies in Germany and Austria (see AktG §161 and UGB §243b, respectively).

As noted above, SRI became increasingly important in Europe. Within two years (between 2007 and 2009) SRI AuM grew by 87 percent and reached EUR 5 trillion at the end of 2009 (Eurosif, 2010). In comparison, total AuM in the EU was EUR 12.755 trillion in 2009 (EFAMA, 2012). Moreover, Europe<sup>2</sup> holds a two third share of total SRI assets worldwide. Primary investors in SRI products were institutional investors, holding a market share of 92 percent of total European SRI market. In particular, public pension funds and reserve funds held nearly two thirds of all institutional investors' SRI assets. The European average allocation of SRI assets was 53 percent bonds, 33 percent equity and 14 percent other assets, including hedge funds, property, private equity, venture capital, monetary assets and commodities (Eurosif, 2010).

In Germany, CSR and SRI evolved already in the 1970s with the first alternative bank "GLS Gemeinschaftsbank" founded in 1974. The official German Corporate Governance Code was published in February 2002 (Eurosif, 2003). While SRI AuM in Germany grew from EUR 5.3 billion in 2005 to EUR 12.9 billion in 2009, the share of SRI was about 0.8 percent of total AuM. Corresponding to EU average, institutional investors dominate the German SRI market. However, religious institutions and charities rather than pension funds account for the most important group of institutional investors for SRI products, while retail investors hold 45 percent of SRI market share. Furthermore, bonds comprise more than half of all German SRI assets (Eurosif, 2010).

## 1.1 Objective

The above presented figures demonstrate a growing supply and demand of SRI products. Hence, the question arises whether this growth has an effect on firms' financing, particularly on their cost of equity capital.

The objective of this thesis is a contribution to various empirical studies investigating a possible relationship between CSR performance and cost of equity capital. Two hypotheses will be tested – on whether CSR ratings affect cost of equity capital and

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<sup>2</sup>Austria, Belgium, France, Germany, Italy, Spain, Switzerland, Netherlands, United Kingdom, Denmark, Finland, Sweden, Norway and Poland.

liquidity, respectively. The focus will be on German stock listed firms rated on their CSR performance by *oekom research AG*<sup>3</sup>.

## 1.2 Structure

This thesis will be structured as follows: After a brief introduction on the topic in chapter one, chapter two will provide a synopsis of a firm's external financing options and cost of capital, followed by the problem of information asymmetries between management and investors. Furthermore, CSR will be defined including a discussion of a firm's responsibility towards its shareholders and stakeholders; costs and benefits of CSR will be covered too.

Chapter three will introduce an extensive list of related research regarding CSR performance and financial performance. In particular, empirical analyses examining a possible relationship between CSR ratings and cost of equity capital as well as equity beta will be presented.

In chapter four, the two hypotheses tested will be presented. Chapter five will comprise the sample description as well as the applied empirical methods. In chapter six the results will be displayed and shortly explained. The thorough discussion of results will be in chapter seven, including a critical assessment of the empirical study itself. The thesis will be closed with some concluding remarks.

Chapter eight will contain a complete list of references. The appendix will comprise used research material.

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<sup>3</sup>*oekom research AG* is a German rating agency specialised in sustainability ratings (see [www.oekom-research.com](http://www.oekom-research.com)).

1.2 Structure

## 2 Theoretical Background

In this chapter the theory behind corporate social responsibility (CSR) and external financing will be discussed. First, cost of capital and equity financing will be defined. Second, CSR will be introduced, followed by a presentation of various views on CSR regarding shareholders, society, costs and benefits. The chapter will conclude with a theoretical framework on how capital markets assess CSR performance and how this might be reflected in financial measures.

### 2.1 External Financing

This subchapter will introduce various ways of calculating cost of capital, including the capital asset pricing model (CAPM) by Ross (1976). Furthermore, different factors influencing equity beta will be presented and information asymmetry and agency costs will be discussed.

#### 2.1.1 Cost of Capital

There are three different ways to finance a firm's project: 1) bonds, 2) retained earnings, and 3) common stock (Modigliani and Miller, 1958). All have a cost of capital for the firm, id est expected rates of return on an investment for investors (Bodie et al., 2007).

There are various ways to calculate a firm's cost of equity capital – either with the capital asset pricing model (CAPM), or with models based on analysts' forecasts. The CAPM is a simplified model based on arbitrage theory and calculates cost of equity capital as the return of a riskless asset plus a risk premium (Ross, 1976). This model will be presented in detail in the next subchapter (see 2.1.2 Capital Asset Pricing Model and Cost of Equity Capital). Other models used to estimate the cost of equity capital, based on financial forecasts, have been published more recently. The following four models have been used in empirical studies for examining possible relationships between cost of equity capital and CSR performance (inter alia Chen et al., 2009; El Ghoul et al. 2011):

– Model of *Claus and Thomas* (2001)

This model calculates cost of equity capital derived from abnormal earnings computed with five years earnings forecasts and long-term growth rate in perpetuity.

## 2.1 External Financing

- Model of *Easton* (2004)

This model calculates cost of equity capital derived from abnormal earnings computed with one year dividend and two years earnings forecasts and abnormal earnings growth in perpetuity.

- Model of *Gebhardt, Lee and Swaminathan* (2001)

This model calculates cost of equity capital derived from share prices computed with three years forecasts of returns on equity and book values as well as subsequent linearly declining returns and constant dividend payouts in perpetuity.

- Model of *Ohlson and Juettner-Nauroth* (2005)

This model calculates cost of equity capital derived from two years earnings per share forecasts and forecasted perpetual growth.

Other empirical studies (see chapter 3) in regard of the relationship between cost of equity capital and CSR performance used one or more of the above described models (Chava, 2010; Dhaliwal et al., 2011; Gregory et al., 2011a; Richardson and Welker, 2001).

### 2.1.2 Capital Asset Pricing Model and Cost of Equity Capital

The capital asset pricing model (CAPM) is a model to calculate the pricing of a risky asset, or rather on a firm-level the cost of equity capital. CAPM has been established by Ross (1976) and is based on the arbitrage theory. Under CAPM, the expected return for an asset equals the return of a riskless asset plus a risk premium for the risky asset. The risk premium is the expected excess return on the market multiplied by the beta coefficient on the market. This beta shows the correlation of an asset's return with the market portfolio. In equilibrium, all independent risk has vanished; hence, in an arbitrage portfolio is no systematic risk, and the expected cost of capital equals the return of a riskless asset. However, CAPM also holds in all sorts of disequilibria (Ross, 1976).

Since only the beta coefficient is firm-specific in regard to CAPM, financial economists have conducted studies to find influencing factors with explanatory power of equity beta. Banz (1981) showed that firm size, measured as total market value of common stock, and equity returns were negatively correlated. More precisely, larger firms tended to have lower risk adjusted returns than small firms. This size effect was not linear, as the negative impact was strongest for small firms. Moreover, the effect was not stable over time with considerable differences of correlations in between tested periods. However, Banz reasoned the size effect could be the result of differences in

information availability which depend on firm size. Thus, investors would bear a higher estimation risk from small firms due to less information available.

Furthermore, Fama and French (1993) developed a five-factor model based on capital asset pricing for inter alia estimating cost of capital. They identified five common risk factors in average stock returns. Those three from the stock market were size (measured as market capitalisation), book-to-market ratio and market beta. The results from Fama and French show that returns of small stocks were much more variable than those of big stocks. Moreover, the spread – predicted by the size-related risk factor – was large. Besides, the model suggests that firm size and book-to-market ratio override the influencing role of leverage as well as earnings-price ratio.

In contrast, Bhandari (1988) found a significant positive relation between returns of common stocks and debt-to-equity ratio. He suggested that the level of leverage served as a proxy for the risk of common equity. Moreover, Bhandari argued that the premium which could be referred to debt-to-equity ratio was no “risk premium” associated with equity beta.

Modigliani and Miller (1958) stated that leverage was an influencing factor on cost of capital. On one hand, WACC increases with the level of leverage up to a certain extent. They argued that a modest amount of debt would not add much risk in a sound firm and hence, yields would not rise noticeably. On the other hand, cost of equity capital rises with the level of leverage.

In regard to liquidity, Amihud and Mendelson (1986) have investigated a possible relation between stock returns and liquidity. They used bid-ask spreads to measure liquidity. Their results showed that average returns were significantly and positively related with spreads, id est more liquid stocks had lower returns. Moreover, they argued that there was a clientele effect, meaning that stocks with higher spreads tended to be held by long-term investors. Thus, stocks with lower levels of liquidity were less spread-sensitive.

Investors are facing information risk when calculating expected returns and assessing a firm's value. Hence, the following subsection will discuss information asymmetry and agency costs.

### **2.1.3 Information Asymmetry**

In 1961, Stigler emphasised the importance of information in economic life and that “knowledge is power” (p. 213), but that current knowledge would become obsolete.

## 2.2 Corporate Social Responsibility

Hence, he argued that the only way to determine a price reflecting new conditions in the market was by search. The role of searching information was inter alia the identification of profitable investment opportunities. Despite uncertainty, Stigler (1961) argued that it was unprofitable to dispose all asymmetries due to costs of search for buyers and sellers. Moreover, the maintenance of correlation of successive prices was impossible due to search costs. Stigler finally concluded that “reputation commands a price” (p. 224) as it cut down search.

While symmetric information is uniformly distributed information, information asymmetry denotes unevenly distributed information among a firm’s management and its (potential) investors (Akerlof, 1970). Thus, asymmetric information creates uncertainty about the distinction between good and bad quality. This in turn gives rise to adverse selection and moral hazard, where sellers may provide misleading information and buyers demand a premium for bearing the risk of uncertainty (Akerlof, 1970).

In this regard, Myers and Majluf (1984) stated that when separating ownership from management, information asymmetries emerged naturally. Management just tends to know more about a firm’s value than its potential investors because it has inside information. This asymmetry goes beyond facts, as managers know what a firm can and cannot do because they have an insider view. Managers have organisational knowledge which is part of their human capital and transmitting their information to investors is costly. Even when there is no necessity to protect proprietary information, informing investors is costly in terms of both, time and money (Myers and Majluf, 1984).

## **2.2 Corporate Social Responsibility**

There have been various studies conducted on the possible effects of CSR performance and firm valuation, particularly on profits (e.g. McWilliams and Siegel, 2000; Gregory et al., 2011a; Cohen et al., 1997), stock market returns (e.g. Kempf and Osthoff, 2007; McGuire et al., 1988; Brammer et al., 2006), cost of equity capital (e.g. Richardson and Welker, 2001; Dhaliwal et al., 2011; El Ghouli et al., 2011) and risk profiles (e.g. Sharfman and Fernando, 2008; Spicer, 1978; Gregory et al., 2011c). This subchapter defines CSR and presents different views on a firm’s responsibilities in regard to its shareholders and society. Furthermore, costs and benefits of CSR for firms are presented.

### 2.2.1 Definition of CSR

There are various definitions of corporate social responsibility (CSR), whereas I deem the following three from the OECD, the World Bank, and the European Commission to be the currently most influencing ones:

*“Corporate Social Responsibility (CSR) is business's contribution to sustainable development.”* (OECD, 2001)

*“The commitment of business to contribute to sustainable economic development working with employees, their families, the local community, and society at large to improve their quality of life, in ways that are both good for business and good for development.”* (World Bank Group, 2003)

*“A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.”* (Commission of the European Communities, 2001)

The common tenor is that a firm makes contributions for a sustainable development. The European Commission limited its definition to only volunteer performance and explicitly integrated environmental concerns. Moreover, the Commission defined eight dimensions of CSR: 1) human resource management, 2) health and safety at work, 3) adaptation of change, 4) management of environmental impacts and natural resources, 5) local communities, 6) business partners, suppliers and consumers, 7) human rights, and 8) global environmental concerns.

Overall, CSR comprises social, environmental and corporate governance aspects with a long-term view, hence sustainability.

### 2.2.2 Shareholder vs. Stakeholder

After defining what CSR is, the question whether CSR falls under the actual scope of a firm arises. There exist both, opponents and proponents, who have arguments from economical and financial standpoints, without mentioning philosophical, ethical or purely social aspects. However, it depends on someone's point of view which side to support. This topic is not a new one from the post-millennium era, but has rather been discussed since more than a century.

Adam Smith (1776) did not deal with CSR itself, but society and individuals as a whole. He introduced the view that only self-interest can promote a society's interest.

## 2.2 Corporate Social Responsibility

Therefore, meeting a firm's self-interest will benefit society the most. Through prices, a society shows what it is willing to pay for specific goods and services. Production costs are the prices a society has to pay for their consumption. If society's perceived value exceeds production costs, the society will make a gain and the firm a profit. Thus, the greater a society's gain, the greater the firm's profit (The Economist 2005).

Already Levitt (1958) saw CSR as a danger to capitalism that could threaten a firm's motive for profit maximisation. Moreover, the CSR movement was, according to him, an attack against big corporations and the profit system. Levitt found CSR as an undermining of a firm's survival for which a sustainable profit was important.

Also Milton Friedman dealt with CSR in his book *Capitalism and Freedom* published in 1962. He advocated the perspective of a free society and capitalism stating that the only social responsibility of a firm is to increase its profits. Friedman (1970) saw the sole responsibility of a firm being towards its stakeholders – stockholders, customers and employees. Furthermore, according to his point of view, managers and executives were not qualified for making decisions on how much and for what to spend money in regard to CSR. The only effect of CSR was an imposition of taxes and the decision on what to spend these. However, this would be the function of governments, not businesses. Sole exception were charity contributions, because these reduced tax payments and generated goodwill, hence were justifiable. Overall, Friedman (1970) saw CSR as a cost generator reducing a firm's profits and stock price.

While Levitt (1985) and Friedman (1970) recognised CSR as a threat to profit maximisation, Narver (1971) argued that a firm can only maximise its value through voluntary actions. More precisely, by incurring added costs in order to reduce its exposure to potential economic and legal risks – exempli gratia due to pollution – and communicating these actions to its markets, a firm will increase its revenues. Furthermore, a firm's risks will be perceived lower and/or its expected earnings higher, what in turn increases a firm's market value.

Jensen and Meckling (1976) argued that subject matters about social responsibilities of business were seriously misleading. They stated that firms were no individuals but "legal fiction[s] which serve as a nexus of a set of contracting relationships among individuals" (p. 310). Moreover, firms would have no motivations or intentions like individuals, but rather market alike behaviour.

Reinhardt et al. (2008) discussed whether firms actually should voluntarily take CSR. They concluded that firms that incur costs for CSR activities may have to deal with shareholder litigation, takeovers, and even market exits in the long run. However, Reinhardt et al. (2008) argue that there was only little evidence that firms actually sacrificed profits for CSR and that firms rather performed CSR activities in a limited way so that it helped reaching their financial objectives.

Another supporter of CSR has been Godfrey (2005). He suggested that philanthropic activities could generate moral capital among stakeholders and provide insurance-like protection for shareholders. Thus, corporate philanthropy could generate shareholder wealth. The level of optimal philanthropy for wealth creation however, varied between firms, increasing with a firm's industry-specific and firm-specific risk profile.

These theoretical views on whether a firm should or should not engage in voluntary CSR activities are very contrary and partly of philosophical economics. Moreover, their opinions of whether a company bears solely responsibilities towards its shareholders or also towards its other stakeholders are diverging. It seems that all parties support the view of shareholder wealth maximisation, but that those from the post-millennium era suggest that CSR, to at least a limited extent, can help to reach that.

### **2.2.3 Costs and Benefits of CSR**

There are various benefits but also costs associated with CSR engagements. These will be described in detail below.

#### *Stakeholder commitment*

First of all, CSR performance can only be measured when it is disclosed. Voluntary disclosure can help a firm to create a competitive advantage (Greening and Turban, 2000). Following stakeholder theory and agency theory, a relationship that is based on trust and cooperation between a firm and its stakeholders can reduce the likelihood of opportunistic behaviour as well as contracting costs (Jones, 1995). However, only in developed countries and up to a certain extent a trusted cooperative relationship can lower these costs; if it is overused, it can trigger the contrary (Foo, 2007). Moreover, social identity theory states that a person's self-image is influenced by the image and reputation of the employing firm; through disclosing CSR performance, a firm can attract and hire more high quality employees. Whereas signalling theory says that a firm's image is shaped by the knowledge of the firm's actions in respect to political and social issues as well as their stakeholders (Greening and Turban, 2000). Furthermore,

## 2.2 Corporate Social Responsibility

stakeholder-oriented firms tend to choose auditing firms for their assurance on sustainability reports to increase its credibility and reputation (Simnett et al., 2009). Hence, voluntary CSR disclosure can increase a firm's stakeholder commitment to the firm, thus increase its competitive advantage through lower contracting costs and a higher qualified work force.

### *Signalling effects*

Furthermore, voluntary disclosure implies signalling effects. Apart from a firm's overall reputation, CSR disclosure can signal a management's talents, id est a manager's type of leadership. Voluntary disclosure is also used by managers to correct undervalued stock or justify poor earnings performance. Moreover, through voluntarily issuing further information beyond mandatory disclosure requirements, a firm can level out gaps as well as issue actual and non-financial information (Graham et al., 2004). Firms that have higher disclosure levels tend to perform well, are large or have only a weak correlation between annual stock returns and earnings. Good performance as an indicator for high disclosure levels can be explained by an adverse selection motive, since a firm's performance has to exceed a certain threshold to cover disclosure costs. The weak above mentioned correlation might be explained by an information asymmetry motive, as with weak correlation, disclosed earnings do not reveal enough information to reduce the asymmetry between management and investors (Lang and Lundholm, 1993). However, management tries to avoid too optimistic and too good disclosures, because these would be difficult to maintain over the long run (Graham et al., 2004). Nevertheless, disclosure tends to be one-sided as management considers the implied expected value of a risky prospect, and volunteers to issue the upside potential rather than the downside risk (Hobson and Kachelmeier, 2005). In addition, volunteer disclosure of "bad news" is also used for signalling credibility. On one hand, it reduces information risk and can be presented in the best possible way; and on the other hand, it can improve a firm's reputation as one that shares information timely and accurately (Graham et al., 2004). Stigler (1986) already noted that a firm's reputation ruled its price because it cuts down costs of information search (see 2.1.3 Information Asymmetry). Hence, voluntary CSR disclosure could serve as a signal for improving a firm's and a manager's reputation, correct undervalued stock, as well as reduce information asymmetry and information risk.

### *Cost avoiding motives*

Apart from image concerns, firms volunteer in communicating bad news to avoid possible lawsuits (Graham et al., 2004). However, possible litigation costs can also reduce the level of voluntary disclosure, particularly for prospective information. Competition also has a restraining effect on the level of voluntary disclosure. By revealing sensitive information to competitors through additional unsolicited disclosure (about projects to be realised in the future), a firm would face proprietary costs. Moreover, issuing further information could bear political costs too. Thus, managers want to avoid undesirable attention from regulators. Moreover, there is empirical evidence that firms are willing to forgo economic value for meeting short run earning targets (Graham et al., 2004). Hence, CSR disclosure can induce costs too, particularly in regard to litigation, competition and politics. These potential cost prospects can limit the level of disclosure.

### *Capital market motives*

Along with the above described motives and effects, there are incentives from capital markets to increase voluntary disclosure too. First, the more information is available about a firm, the more it attracts analysts. Analyst coverage in turn has an important influence on stock prices (Graham et al., 2004). Second, reduced information asymmetries increase market liquidity which attracts institutional investors. These institutional investors provide trading activity and hold large positions (Diamond and Verrecchia, 1991). Third, additional information lowers information risk which helps to build and nurture relationships with institutional investors (Graham et al., 2004). Fourth, not only voluntary disclosure but also CSR performance itself attract institutional investors, because they face utmost pressure to take sustainable and responsible investment (SRI) decisions (Cox et al., 2004). Fifth, voluntary CSR disclosure can have a negative effect on a firm's cost of capital (Dhaliwal et al., 2011). Furthermore, investors tend to be most interested in so called ESG (environmental, social and governance) disclosure scores – a score that measures the degree of transparency, provided inter alia by *Bloomberg L.P.*<sup>4</sup>. After ESG disclosure scores, investors are most interested in governance, environment and social disclosure, respectively (Eccles et al., 2011). Hence, voluntary CSR disclosure can attract more analysts and institutional investors, as well as increase liquidity and reduce its cost of capital.

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<sup>4</sup>*Bloomberg L.P.* is a network of business and financial information (see [www.bloomberg.com](http://www.bloomberg.com)).

## 2.3 CSR and Capital Markets

Despite these primarily theoretical approaches of potential costs and benefits in respect to CSR performance, it is the reactions of capital markets that interests management the most when deciding over the level of CSR performance. Thus, the following subchapter will present primarily theoretical frameworks on how the capital market might value CSR performance and its disclosure.

### 2.3 CSR and Capital Markets

An investment concept named “sustainable and responsible investment” (SRI) gained popularity in the post-millennium era. In Europe<sup>5</sup>total SRI assets under management grew from less than EUR 3 trillion in the year 2007to EUR 5 trillion in 2009. SRI stands for the “valuation and incorporation of Environmental, Social and Governance (ESG) issues into fund management” (Eurosif, 2010). Thus, this subchapter will discuss investor’s preferences and market valuation regarding CSR.

#### 2.3.1 Investor’s Preferences

Albeit the impressive growth of SRI assets, total core SRI assets only represent ten percent of total assets under management in Europe (Eurosif, 2010). Hence, knowing the supply of stock from CSR active firms, its demand by investors will be considered more closely as follows:

Mackey et al. (2007) suggest in their theory that there are investors that base their decision on other criteria than just wealth maximisation. More precisely, some investors derive benefit, apart from earnings benefit, from CSR activities of the invested firm. Additionally, Mackey et al. (2007) theorise that if demand of stocks with high CSR performance exceeds its supply, CSR based investments will create economic value for those firms. If supply exceeds demand, CSR activities can destroy market values of these firms.

Another theory about “green investors” has been developed by Heinkel et al. (2001). In particular the authors assume that green investors who have no tolerance of environmental damage, exclude polluting firms from their portfolios. This exclusion creates a lack of risk-sharing amongst green-neutral investors which in turn reduces stock prices of polluting firms and thereby increases their cost of capital. If the increase in cost of capital exceeds the costs for reforming, polluting firms will take CSR actions. Thus, green investors can change corporate behaviour.

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<sup>5</sup>Austria, Belgium, France, Germany, Italy, Spain, Switzerland, Netherlands, United Kingdom, Denmark, Finland, Sweden and Norway.

Besides theoretical approaches of investors' preferences, Eccles et al. (2011) examined the interests of investors regarding a firm's degree of transparency. They found that interests of equity investors differ from debt investors. Equity investors were most interested in overall ESG disclosure scores, as they serve as an indicator for management quality. Environmental disclosure scores ranked second, which shows that equity investors were concerned about possible economic, legislative and regulatory effects on equity prices. While investors were also interested in governmental disclosure scores, social disclosure was not included in their top 20 preferences list. Eccles et al. (2010) also found differences between types of investors. Overall, insurance companies were most interested in disclosure scores, followed by pension funds and hedge funds showed the least interest. The first two are investing more in assets with a long-term perspective where low degrees of transparency would bear a high risk level of uncertainties. Hedge funds, on the other hand, can interpret lack of transparency as potential hedge opportunities since those firms might be undervalued due to high uncertainty levels.

When asking investors in surveys about CSR, most of them reported to believe that corporate governance can affect a firm's actions and its value (Starks, 2009). Particularly institutional investors shared this opinion. Nevertheless, empirical evidence on the effect corporate governance on firm value was mixed. Moreover, only a minority of investors, mostly specialised institutional investors, thought that social responsibility matters could affect a firm's actions and its value (Starks, 2009).

In addition, Cox et al. (2004) examined institutional investors' preferences. They found that long term investment positions of institutional investors were positively correlated with CSR performance. Furthermore, these investors' selection process was characterised by the rejection of firms with the worst CSR performance. Institutional investors seemed not to prefer companies with charitable contributions.

Analyst recommendations have an impact on investor's decision as well. The empirical evidence by Ioannou and Serafeim (2011) showed that analysts changed their perception of CSR performance over time. While in earlier periods (before 1997) CSR strategies were treated as value destructive and negatively affected recommendations, in later periods analysts graded CSR strengths as value enhancements. Thus, later analysts were more likely to recommend a firm with high levels of CSR performance. Moreover, firms with higher transparency in regard to CSR activities tended to get more favourable recommendations. Analysts' ability was found to be correlated with higher

## 2.3 CSR and Capital Markets

valuation of CSR performance; meaning that analysts with more experience, greater availability of resources as well as broader awareness of CSR tended to treat CSR strengths as creating firm value.

Hence, investors can change the demand-supply ratio of CSR active firms and thereby influence the effect on valuation of CSR performance, id est market value as well as cost of capital. Investors, particularly institutional investors, are interested in ESG and individual disclosure scores and their decisions seem to be influenced by them. Moreover, analysts became perceiving CSR activities as value creating and their recommendations influence investors' investment decisions as well.

### 2.3.2 CSR and Market Valuation

Besides investor's interests and opinions, financial performance and capital market indicators, such as liquidity or cost of capital, can reflect possible CSR effects too. Heal (2005) argues that CSR can reduce costs of conflicts since CSR plays an important resource allocation role in the cases of market failures and strong distributional disagreements. Hence, Heal (2005) sees CSR as a profitable component of corporate strategy and as a contribution to risk management, which can reduce costs and in turn increase profits. Moreover, he reasons that CSR helps maintaining relationships for ensuring long term profitability.

A hypothesis regarding outperformance by Renneboog et al. (2008) states that CSR signals good management quality which favours financial performance by decreasing the likelihood of incurring high costs. Thus, firms with high level of CSR performance can – but not necessarily do– outperform benchmarks. The key assumption underlying this hypothesis is that stock markets do not price CSR activities correctly in the short run. Moreover, Renneboog et al. (2008) concluded that there was no clear evidence that SRI investors trade optimal financial performance for pursuing social and ethical objectives.

Furthermore, Leuz and Verrecchia (2000) suggested that increased disclosure levels lower bid-ask spreads of stocks. Bid-ask spreads measure the level of information asymmetry between management and investors and are related to costs of capital. In addition, they find that an improved disclosure level can raise trading volumes of the firm's shares outstanding. Trading volumes measure the level of liquidity of a firm's stock, id est the willingness of investors to buy and sell shares of that firm. Thus, Leuz and Verrecchia (2000) conclude that voluntarily committing to increased disclosure levels can yield financial benefits in regard to cost of capital.

Diamond and Verrecchia (1991) argued that cost of equity capital and the commitment to CSR disclosure were more strongly related compared to the association of cost of equity capital with the level of CSR disclosure; this might be due to the commitment to disclosure which solely claims information disclosure irrespective of its content. Furthermore, the authors reasoned that voluntary disclosure improved a firm's liquidity of stock through reducing the information asymmetry between informed and uninformed investors. This in turn lowered a firm's cost of capital. Besides, if prior asymmetry of information was large, the subsequent stock price would rise too. Diamond and Verrecchia (1991) conclude that a maximum stock price can be only achieved with some information asymmetry, and large firms financially benefit most from voluntary disclosure.

Regarding levels of disclosure, Hail and Leuz (2006) found that in countries with tight securities regulations – such as comprehensive disclosure rules and effective law enforcement – firms' costs of capital, measured as the implied cost of capital, were systematically lower. Particularly in countries with mandatory issuance to investors, the cost of capital effect strongest was. In countries with the least integrated markets the disclosure level affected cost of capital the most. However, the discovered relationship between disclosure levels and cost of capital was insignificant in countries with integrated capital markets.

In case arbitrage pricing theory holds, Hughes et al. (2007) argued that information about systematic factors, id est information from the market, would affect cost of capital through factor risk premiums. Such systematic factor information would not influence factor loadings (beta). However, they reasoned that information about idiosyncratic risks (firm specific) would not have an effect on a firm's cost of capital. Thus, CSR performance reducing firm specific risks should have no effect on cost of equity capital. Nevertheless, a lower ratio of informed over uninformed investors about a firm would reduce uncertainties of this firm and, thus lower its cost of capital. As a consequence, a higher level of CSR disclosure can reduce a firm's cost of capital due more informed investors.

Feldman et al. (1997) investigated annual reports in regard to environmental information disclosure. They found that increased environmental disclosure substantially lowers risk perception of that firm. Thus, the stock price increases by about five percent. Feldman et al. (1997) argued that disclosure above mandatory

## 2.3 CSR and Capital Markets

enhanced shareholder value. Furthermore, they reasoned that environmental investments could give rise to considerably positive returns as well as lasting value.

Hence, CSR activities and disclosure can reduce costs of conflicts and the likelihood of incurring further costs, thus improving financial performance. Increased disclosure can lower bid-ask spreads and elevate share turnover of a firm's stock (liquidity). Higher levels of CSR disclosure can reduce a firm's cost of capital, though such negative effect on cost of capital is more significant in countries with least integrated markets. Moreover, increased environmental performance and its disclosure can enhance a firm's stock price as well as its shareholder value.

While this chapter has focused on the theoretical grounds of CSR and cost of capital, the next chapter will present an extensive list of prior studies related to CSR disclosure and its impacts on profitability, accounting figures, stock market returns, cost of equity capital as well as risk premiums.

### **3 Related Research**

Besides various theoretical approaches regarding cost of capital and corporate social responsibility (CSR), many empirical research studies have been conducted. All studies presented below analysed a possible relationship between CSR and financial performance, though from different perspectives. While some analyses have focused on CSR and voluntary disclosure of information, others aimed to investigate the link between CSR and profits as well as other accounting figures. Other studies used stock market measures, such as returns, cost of equity capital and beta, to find a link between financial and CSR performance. Hence, this chapter on related research is divided into six subchapters covering the above five research areas as well as two meta-analyses.

#### **3.1 Disclosure and Assurance**

As discussed in chapter 2 (see 2.1.3 Information Asymmetry and 2.2.3 Costs and Benefits of CSR), firms additionally communicate information beyond what they are legally required to do in order to reduce asymmetric information. Although CSR disclosure is mandatory in certain countries in the form of an integrated report (see 1 Introduction), the quality and depth of sustainability or environmental reports vary between firms across industries and countries (Ioannou and Serafeim, 2010).

In respect to disclosure level and cost of equity capital, Botosan (1997) found a negative relationship between voluntary disclosure in annual reports and cost of equity capital only in firms with low analyst following. Greater level of disclosure seemed to have no effect on firms with high analyst following. However, the sample of included firms was rather small and limited (122 U.S. manufacturing companies from 1990). Moreover, the analysed annual reports were from the year 1990 and within the last 22 years, legal requirements and corporate disclosure common practice has faced a lot of change.

Al-Tuwaijri et al. (2004) analysed the content of 198 U.S. companies' information which had been reported in SEC Forms 10-K regarding recycled toxic waste in 1994. Their main finding was a positive and significant relationship between environmental and economic performance. Furthermore, their results showed a significant association of high environmental performance level with more extensive and quantifiable disclosure of this performance.

### 3.2 Profits and Other Accounting Figures

Although one could think that discretionary disclosure would attract opportunistic behaviour and that companies would tend to publish more than optimistic forecasts in order to reduce financial constraints or improve short-term financial statistics, a study by Frankel et al. (1995), with a sample of 1,880 U.S. firms (1980-1983), showed the contrary. Despite Frankel et al. (1995) found a positive relationship between firms with external financing and issuing earnings forecasts, their empirical evidence showed that forecasts by management did not tend to be systematically higher – neither in comparison to analysts' expectations nor to subsequently realised earnings. Moreover, the results showed that firms were not more likely to disclose more forecasts just before issuing more capital. Thus, Frankel et al. (1995) concluded that forces like potential legal liability as well as reputation costs motivated management to disclose unfavourable information too.

In some countries the issuance of a sustainability report is already governed by regulations (see 1 Introduction). Ioannou and Serafeim (2011) investigated the effect of prescribing the issuance of sustainability reports by law on management practices in 58 countries. Their sample covered more than 3,000 unique firms and the years 1995 until 2008. Their empirical study shows that mandatory sustainability reporting increases CSR of business leaders, id est improves ethical and social behaviour as well as promotes prioritising sustainable development. The results suggest that non-disclosure of bad performance or loss of credibility through failure to meet previously published false expectations can effectively force management to change its corporate behaviour in the long-run. These effects were found to be even stronger in countries with greater enforcement mechanisms and more frequent assurance of information about sustainability.

Hence, the above described empirical studies provide evidence that firms which are more active in regard to environmental protection disclose more information voluntarily. Furthermore, only firms with low analyst following benefit from a reducing effect of cost of equity capital from voluntary disclosure. Market forces generally deters management from disclosing over-optimistic forecasts and only favourable information. In addition, mandatory disclosure of sustainability reports effectively improves a firm's ethical, environmental and social performance.

### **3.2 Profits and Other Accounting Figures**

Beyond the effect of disclosing non-financial information, the effect of social and environmental performance on a firm's profitability, based on accounting figures, has

been analysed. Regarding profits, no direct significant association has been found (see studies as follows).

Only Bnoui (2011) found a positive marginal relationship between the level of CSR and financial performance, measured as the ratio of profit over turnover, for 80 French small and medium enterprises in the year 2006. Her results provide evidence in favour of the slack resources theory for which a certain level of profitability is necessary for a firm to sustain a social responsible strategy.

However, McWilliams and Siegel (2000) conducted an empirical study of 524 U.S. firms (1991-1996) and their results showed only a “neutral impact” of CSR on accounting profits. Furthermore, they argued that former studies investigating this relation were inconclusive and mostly upwardly biased because research and development (R&D) expenditures – the important driver of profits – had been ignored.

In comparison, Gregory et al. (2011a) found a positive and significant relationship between CSR and net income per share, book value per share as well as R&D expenditures for their sample of U.S. firms (19,050 firm-year observations). Their results suggest that principally the negative valuation of CSR drives the effect of the investigated valuation measures. Gregory et al. (2011c) provided empirical evidence that a high CSR rating had a positive impact on net income and net book value with a portfolio returns test of U.S. firms (23,856 firm-year observations) between the years 1991 and 2008. They argued that if there was a virtuous circle between CSR and financial performance, R&D expenditures and CSR indicators both would positively affect a firm’s market value.

Moreover, Hassel et al. (2005) showed in their study of 71 Swedish stock listed companies (1998-2000) that both, net income and equity book value, had an explanatory power regarding environmental performance. However, according to their empirical results, good environmental ratings had a negative influence on the analysed market values. Hassel et al. (2005) explained the negative relationship by means of the “cost-concerned school” (p. 56) which takes the view that great environmental performance negatively affected market values and expected earnings through higher costs incurred.

Covering the years 1977 until 1985 with a sample of 131 U.S. firms, McGuire et al. (1988) found a negative relationship between CSR and operating income growth, which was even stronger for growth prior to the rating than for subsequent income

### 3.2 Profits and Other Accounting Figures

growth. They suggested that financial performance associated with CSR ratings might be partially artefacts of prior high financial performance. Moreover, McGuire et al. (1988) argued that for firms with high financial performance higher levels of CSR performance were easier affordable.

The relationship between CSR and profitability, measured by the return on assets (ROA), has been investigated as well. Aupperle et al. (1985) conducted an empirical study of 241 U.S. companies for the year 1982. The results suggested no relationship between ROA and CSR.

Cohen et al. (1997) investigated two pollution portfolios of 375 U.S. companies between 1987 and 1991, with low and high levels, respectively. They found no statistically significant relation between environmental performance and ROA and return on equity (ROE), respectively. Cohen et al. (1997) explained the result in a way that firms in the high pollution portfolio might have found ways to increase their environmental performance cost-efficiently over time.

Choi et al. (2010) analysed the relationship between ROA, ROE as well as Tobin's Q (total market value over total asset value) and CSR of 187 Korean firms for a period of seven years (2002-2008). The authors found that ROA was positively correlated with CSR, and when using a stakeholder-weighted index, they even found positive correlations between all three performance measures and CSR. Moreover, their analysis revealed a positive and significant relationship between CSR and ROA, ROE as well as Tobin's Q.

In addition, McGuire et al. (1988) found positive relations between CSR and ROA as well as total assets. Besides, they found that prior rather than subsequent accounting performance was more closely related to CSR. Their study provided evidence that particularly ROA was a better CSR predictor than market measures. McGuire et al. (1988) argued that accounting measures were more sensitive to unsystematic factors than market measures. Hence, if the perception of CSR was unsystematic, ROA will better reflect a firm's CSR level than any other market measure.

Waddock and Graves (1997) showed with their empirical research that good financial performance – measured as ROA, ROE and return on sales– led to higher corporate social performance and vice versa. The authors also suggested a possible virtuous circle between financial and corporate social performance, simultaneously and

interactively impacting each other. Their sample covered 469 U.S. firms and a time period of three years (1989-1991).

Eccles et al. (2012) used ASSET4 ratings from Thomson Reuters of 180 U.S. firms. They examined the association of voluntary CSR performance with a firm's stock market return, measured with ROA, ROE and market-to-book value, and leverage over a time horizon of 18 years (1993-2005). Their results provided evidence that in the long-run, high CSR rated firms significantly outperformed low CSR rated firms in terms of accounting performance. Particularly in industries, where competition for brands and reputation was very strong or products depended heavily on natural resources, outperformance was even greater.

Apart from profit and profitability, there are more accounting figures which have been analysed in terms of a possible association with CSR. Cochran and Wood (1984) used for their empirical study the following five measures: operating earnings over sales, operating earnings over assets, excess value, asset age and asset turnover. They analysed U.S. firms between 1970 and 1979 (366 firm-year observations). The authors' main finding was a strong and significant correlation between CSR and asset age within industry groups, while operating earnings over sales and excess value of minor significance for CSR. Thus, firms with younger assets proved to have better CSR ratings. Cochran and Wood (1984) concluded that there was only weak support for a relationship between financial performance and CSR.

Furthermore, Lev et al. (2010) investigated the relationship between sales growth and charitable contributions of 251 U.S. firms (1989-2000). Particularly for companies in highly sensitive consumer goods sectors they found a positive and significant correlation between sales growth and charitable contributions. Only a marginally significant relation between revenues and future contributions was revealed, but a positive significant association between contributions and future revenues. Lev et al. (2010) conclude that charitable giving could improve future sales and revenues as well as further a firm's economic objectives.

McGuire et al. (1988) analysed 131 U.S. companies in respect to CSR and various financial and accounting performance measures as well. However, they found no statistical significance between sales growth and CSR.

Based on accounting figures, Cheng et al. (2012) examined the relationship between CSR ratings and financial constraints of firms from 49 different countries (2002-2009).

### 3.3 Stock Market Returns

They constructed a KZ index developed from and named by Kaplan and Zingales (1997), consisting of five accounting ratios: cash flow to total capital, market to book ratio, debt to total capital, dividends to total capital, and cash holdings to capital. Their empirical results of 10,078 firm-year observations showed that firms with higher CSR ratings faced lower capital constraints. Cheng et al. (2012) explained the better access to finance through less opportunistic behaviour by superior stakeholder engagement, and reduced information asymmetries by greater disclosure.

Hence, there is no empirical proof for a relationship between a firm's profit and CSR, but for CSR and net income as well as R&D expenditures. There are only inconclusive results regarding the relationship between CSR and ROA or ROE, respectively. Moreover, there is a positive association between CSR and Tobin's Q; however, these results are from the same study that has found a positive correlation for ROA, ROE and CSR. Besides, asset age and CSR are negatively but significantly correlated within industry groups. Although charitable contributions can improve future sales and revenues, there was no statistically significant relationship between sales growth and CSR. One positive effect of better CSR ratings are reduced financial constraints due to superior stakeholder engagement and greater disclosure of information.

### **3.3 Stock Market Returns**

Apart from accounting figures, measures from financial markets have been used to analyse a possible impact of CSR on a firm's performance. One of the most prominent financial performance measures are monthly stock returns. Kempf and Osthoff (2007) formed two portfolios based on CSR performance of U.S. stock listed firms covering the S&P500 between 1991 and 2004. The high CSR performance portfolio never had a considerable negative performance or performed any loss. Kempf and Osthoff (2007) concluded that trading strategies based on CSR screens could yield abnormal performance compared to the average market.

Ziegler et al. (2002) investigated the relationship between monthly stock returns and environmental and social sustainability of 214 European stock-listed firms (1996-2001). They found that a high level of both, environmental and social performance, had a significant positive and negative effect on a firm's valuation, respectively. However, these findings only hold true when comparing industries, but not companies; Ziegler et al. (2002) found no significant effect on stock returns on a company level.

Hong and Kacperczyk (2009) used SIC codes for identifying firms in so called “sin industries”, namely alcohol, tobacco and gaming. Their sample comprised 193 U.S. firms and 42 years (1962-2003). The results provided evidence that firms in sin industries had higher expected returns than comparable firms in other industries. Hong and Kacperczyk (2009) argued that investors were willing to pay a (financial) price for not holding stock of sin industries.

McGuire et al. (1988) analysed the relationship between risk-adjusted returns and CSR, but no statistically significant result was revealed. However, Cohen et al. (1997) empirically proved that total risk-adjusted returns to shareholders were significantly related to the environmental performance of a firm. They used a sample of 375 U.S. firms included in the S&P 500 index and formed one low and one high pollution portfolio. Cohen et al. concluded that the low pollution portfolio met or even outperformed the S&P 500 market.

Financial performance, measured as return on stock, was also the main variable Brammer et al. (2006) used for investigating a possible relationship between corporate social and financial performance of 451 UK firms listed at the Financial Times Stock Exchange per July 2002. Their results showed a significant negative relation between the two performance measures; only firms with low CSR ratings yielded abnormal returns. Brammer et al. (2006) concluded that certain investors had to be willing to forgo returns in order to be morally on the safe side. However, their results suggested that firms were punished by a negative impact on the bottom line, which shareholders seemed to realise only slowly.

In respect to timing, Brammer and Millington (2008) analysed the correlation between corporate charitable giving and a firm’s market performance, measured as change in stock price plus current dividends over prior period’s stock price, in the UK. Their research sample comprised 537 firms and ten years (1990-1999). The results showed that firms with unusually high and low charitable ratings had the higher financial performances. More precisely, firms with unusually low social performance financially performed best in the short run, while firms with unusually high social performance financially performed best in the long run.

Rao (1996) analysed 14 U.S. companies between 1989 and 1993. Not surprising is his finding that when unethical behaviour, particularly regarding pollution, had been discovered and published, the stock value in terms of cumulated average abnormal returns had fallen.

### 3.4 Cost of Equity Capital

The effect of the inclusion of a firm in a sustainability index was investigated as well. Robinson et al. (2008) analysed the relationship between the inclusion of 186 North American firms in the Dow Jones Sustainability Index (DJSI) and their possible cumulative abnormal returns between 2002 and 2007. The authors' main finding was that an inclusion in the DJSI permanently increased a firm's share price.

Goss (2007) examined a possible link between CSR ratings and financial distress in the U.S. (1,295 firm-year observations, 1991-2003). He found a significant negative relationship between a firm's rating and its distance to default. Accordingly, his results showed that firms with high CSR ratings were less likely to exit the market than to be taken over; whereas low rated firms faced the same likelihood of a default and a takeover. Therefore, Goss (2007) argued that CSR levels did not only have an impact on returns, but also on a firm's risk profile.

Hence, there is inconclusive empirical evidence on the relationship between CSR and stock returns. On one hand, portfolios consisting of firms with only good CSR performance yield abnormal performance in the U.S. On the other hand, empirical results of UK firms suggest a negative relationship between CSR performance and stock returns. Moreover, firms in sin industries tend to have higher expected returns than other comparable firms. Another study of U.S. companies (McGuire et al., 1988) has not found any impact of CSR ratings on risk-adjusted returns. At an industry level, high ratings for environmental sustainability seem to have a positive effect on stock returns, but high ratings for social sustainability a negative effect; the latter seems to not holding true at a company level. Although unusually low corporate charitable giving can positively impact the stock performance in the short run, the opposite might apply over a long time horizon. Furthermore, the discovery and publication of polluting activities of a firm might have a negative impact on its abnormal returns while the inclusion in a sustainability index permanently increases a firm's share price. In addition, CSR levels seem to be an important determinant of financial distress, showing a negative relationship between CSR ratings and distance to default.

### **3.4 Cost of Equity Capital**

One specific performance measure of capital markets is a firm's cost of capital, and in particular its cost of equity capital (see 2.1.1 Cost of Capital). Various studies have been conducted to examine a possible relationship between a firm's CSR ratings and cost of equity capital in order to see whether capital markets punish or reward great CSR performance; these will be described more closely in this subsection.

In regard to disclosing CSR performance in a firm's annual report, Richardson and Welker (2001) examined 124 Canadian firms' cost of equity capital and their level of social disclosure (1990-1992). They found that CSR disclosure ratings and cost of equity capital were significantly positively related, but less pronounced in firms with good financial performance. The disclosure ratings were exclusively rating the completeness and informativeness of disclosure, but not the content itself. Richardson and Welker (2001) argued that this positive relation might have arisen from self-promoting grounds with a severe upward bias, disclosing more information about a firm's social investments, and costs incurred that the market might penalise through higher costs of equity capital.

Compared to Richardson and Welker (2001), Dhaliwal et al. (2011) provided empirical evidence from 213 U.S. firms (1993-2007) that voluntary CSR disclosure is associated with a decrease in a firm's cost of equity capital. Furthermore, high cost of capital firms were more likely to initiate CSR disclosure in the subsequent year than firms with lower cost of capital. Those initiating firms with high CSR performance then had reduced costs of equity capital, attracted more institutional investors and analysts that also tended to reach smaller forecast errors. More importantly, firms initiating CSR disclosure were more likely than others to issue new equity capital in the subsequent two years and to a significantly greater amount. Dhaliwal et al. (2011) suggested that managers initiated CSR disclosure in order to raise cheaper external capital.

The majority of studies assessing a possible link between CSR ratings and cost of equity capital used a sample of U.S. companies and CSR ratings by KLD Research & Analytics Inc. (now MSCI Inc.) covering all or a part from a time horizon between the years 1990 and 2008. One of these studies conducted by El Ghouli et al. (2011) examined a possible CSR effect on a firm's equity financing of 2,809 U.S. firms (1992-2007). Their results provided evidence that better rated firms had lower cost of equity capital. Particularly improvements in the areas of employees, environment and product strategies substantially reduced a firm's cost of equity capital, whereas the areas community, diversity and human rights had no impact. Moreover, El Ghouli et al. (2011) showed that operating in "sin industries" – tobacco and nuclear power – led to an increase of capital costs. The authors argued that CSR performance had explanatory power regarding a firm's cost of equity capital "beyond corporate governance and other risk factors" (p. 2401).

### 3.4 Cost of Equity Capital

Markets not always rewarded firms for high CSR performance to the same extent. According to the empirical results from Gregory et al. (2011b) of U.S. firms (23,078 firm-year observations, 1990-2008), markets appeared to higher value better CSR ratings in the post-millennium period. The valuation effect was on one hand caused by a cost of capital effect rewarding firms for a high level of CSR performance. On the other hand, a cash flow effect made higher rated firms more persistent against abnormal earnings shocks. The authors noted that portfolios which were based on CSR ratings did not implicitly outperform the market.

In contrast to Gregory et al. (2011b) who used realised returns as the measurement of the cost of equity capital, Chava (2010) used implied costs of capital (ICC) derived from earnings estimates made by analysts. The sample covered between 500 and 2,000 U.S. firms for each of the investigated 18 years (1991-2008). Nevertheless, his results provided evidence that firms with environmental concerns faced significantly higher costs of capital. Firms with environmental strengths though showed no significant association with expected stock returns. Chava (2010) argued that this cost effect might emerge from socially responsible investors not investing in firms with environmental concerns. This argument was supported by his results showing that both, firms with environmental concerns but also with environmental strengths, tended to have lower institutional ownership and fewer institutional investors than neutral firms. The results support the above presented findings of El Ghouli et al. (2011) regarding sin industries.

Furthermore, Gregory et al. (2011a) examined the relationship between ICC and CSR ratings. Their study provided evidence that firms with high CSR ratings had significantly lower ICC and higher expected growth rates in abnormal earnings than low rated firms. Gregory et al. (2011a) suggested that the valuation effect, or the positive impact on stocks of high CSR rated firms, was driven by an interaction of both, long-term ICC and implied growth of abnormal earnings. They argued that firms with high CSR ratings faced significantly lower levels of market risk exposure which explains the positive impact of CSR ratings on expected stock performance.

In contrast to the above described studies, Sharfman and Fernando (2008) used the capital asset pricing model (CAPM) to calculate a firm's weighted average cost of capital (WACC), including cost of equity capital, cost of debt capital and equity beta. Their sample comprised 267 U.S. firms for the year 2002. The empirical results showed that superior environmental performance reduced a firm's WACC. Sharfman and

Fernando (2008) argued that improvements in environmental performance improved a firm's environmental and subsequently overall risk management. Moreover, the authors found that although firms with increased environmental performance tended to be higher leveraged; these firms still faced both, lower cost of equity capital and WACC. Like Chava (2010), Sharfman and Fernando (2008) also showed that improvements in environmental risk management reduced the level of institutional holders of a firm. Their results did not validate a relationship between cost of equity capital and the level of institutional holdings. Furthermore, environmental risk management performance was positively related to share ownership concentration, and ownership dispersion was negatively associated with cost of equity capital.

Most studies above used KLD ratings prepared by *MSCI Inc.*, which assesses companies according to their environmental, social and corporate governance performance (El Ghoul et al., 2001; Gregory et al., 2011b; Chava, 2010; Gregory et al., 2011a; Dhaliwal et al., 2011; Sharfman and Fernando, 2008). By contrast, Chen et al. (2009) examined only the relationship between corporate governance and cost of equity capital in firms in 17 emerging markets (559 firm-year observations, 2001-2002). They provided evidence that higher level of corporate governance reduced a firm's cost of equity capital, particularly in countries with weak legal protection. Chen et al. (2005) argued that a firm's level of corporate governance and a country's level of legal investor protection were substitutes for each other regarding the reduction of cost of equity capital.

Hence, greater CSR disclosure levels can increase a firm's cost of equity capital. Voluntary CSR disclosure in combination with superior CSR ratings is followed by a reduction in cost of equity capital which managers anticipate and seem to use by issuing new equity capital in the subsequent years. Lower ratings seem to be associated with lower cost of equity capital, and firms operating in sin industries may face higher cost of equity capital. Thus, environmental concerns might as well negatively affect a firm's implied cost of capital, but environmental strengths seem to have no effect on a firm's expected stock returns. A valuation effect arising from high CSR ratings tends to lower a firm's cost of equity capital and to intensify its persistence against expected adverse cash flow shocks; the latter emerges probably due to higher expected growth rates in abnormal earnings. Although higher CSR ratings may lead to higher levels of leverage, the cost of equity capital and WACC may decrease. Particularly the level of corporate governance seems to be negatively associated with cost of equity capital.

### 3.5 Risk Premium

#### **3.5 Risk Premium**

The cost of equity capital can be calculated differently (see 2.1.1 Cost of Capital). According to the CAPM, the cost of equity capital equals the risk free rate plus a risk premium. This risk premium is calculated by a market premium multiplied by a firm's measure of systematic risk, called equity beta. Therefore, researchers use just equity beta as a measure of cost of equity capital too.

Anderson and Frankle (1980) analysed the relationship between equity beta and voluntary social disclosure in 314 U.S. firms (1972-1973). They formed portfolios of disclosing and non-disclosing firms with equivalent systematic risk exposures for comparison. Empirical results provided evidence that markets valued voluntary social disclosure positively. Noteworthy, markets seemed not to distinguish between financial and non-financial information in social disclosures. Moreover, continuous disclosure was higher valued by the markets than initiations, with portfolios with higher betas having the greatest impact of continuity on valuation.

Although Gregory et al. (2011c) conducted an empirical study investigating the relationship between firm's equity beta and CSR ratings; they noted the problem of no clarity whether CSR exposure was actually a priced and systematic risk factor. Nevertheless, Gregory et al. found that high CSR ratings were associated with lower equity betas. Particularly high ratings in community, environment and diversity were most significant of all CSR areas for betas. Furthermore, they suggested that some of the observed differences in risk arose from industry effects.

Sharfman and Fernando (2008) also provided evidence of a negative relation between CSR ratings and equity beta with their study of WACC and environmental risk management. Corporate governance concerns were shown to be significantly associated with WACC. They argued that financial markets rewarded firms for better environmental risk management through lowering the volatility measure of their stocks – beta. Moreover, this negative relationship reflected on one hand resource efficiency and on the other hand the market's perception of a firm's risk profile.

The same result of high CSR stocks having lower equity betas was obtained by Gregory et al. (2011b). The only exception was the CSR performance in respect to products for which they found a positive association; performances in all other areas, namely governance, diversity, employee and environment had a negative relation with a firm's equity beta.

The results from El Ghouli et al. (2011) confirmed the previous results of a negative relationship between equity beta and CSR ratings. Although only used as a control variable, the results showed that equity beta and CSR scores had a negative<sup>6</sup> and significant coefficient. Therefore, the authors concluded that firms with low CSR ratings had a higher perceived risk.

Gregory et al. (2011c), Sharfman and Fernando (2008), Gregory et al. (2011b) and El Ghouli et al. (2011) used KLD data for the measurement of a firm's CSR performance. However, there have also been studies using ratings from other sources or even just the SIC codes for allocating firms to "sin industries". For example, McGuire et al. (1988) used ratings on corporate reputation from Fortune magazine's annual survey. They examined the effect of CSR performance on a firm's financial and accounting performance. Financial risk measures, exempli gratia beta, showed negative correlations with CSR ratings for both, financial performance prior CSR ratings as well as CSR ratings prior financial performance. However, their results also showed that accounting-based risk measures, exempli gratia operating leverage, had a greater explanatory power than beta. McGuire et al. suggested that CSR performance was "predominantly unsystematic" (p. 868) and while beta reflected mainly systematic risk, accounting measures reflected unique, unsystematic firm risk. Thus, the relationship between accounting-based risk measures and CSR performance seemed to be stronger.

Focused on one industry, Spicer (1978) analysed the relationship between CSR performance and a firm's risks in the U.S. pulp and paper industry (18 firms) from 1968 until 1973. He found negative associations between CSR performance and total risk as well as systematic risk (beta). In particular, firms with better pollution controls had lower total and systematic risk. However, the significant associations disappeared over time. He suggested that this diminution might emerge from the fact that these kinds of associations might just be "relatively short-lived phenomena" (p. 109) arisen from public pressure.

Another alternative classification of companies regarding their CSR performance is according to industries through their SIC codes. Hong and Kacperczyk (2009) used SIC codes for identifying firms in so called "sin industries", namely alcohol, tobacco and

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<sup>6</sup>El Ghouli et al. (2011) actually stated a „positive and significant relationship“ (p.2395) in their publication; however, the sign depends on the treatment of the underlying ratings for the statistical analysis.

### 3.5 Risk Premium

gaming. Although they found evidence that firms in sin industries had higher expected returns than comparable firms in other industries, there was no effect from sin industries on beta.

All the above presented studies were conducted with samples of U.S. firms. Thus, Sharfman and Fernando (2008) raised the question whether the results of a significant negative relationship between equity betas and the level of environmental risk management still held in countries with higher pressure on firms for improving their environmental risk management, such as Australia or in Europe. Ziegler et al. (2002) examined the relationship between CSR performance and equity beta of 214 European companies. Like Hong and Kacperczyk (2009), Ziegler et al. (2002) found a positive significant relationship between a firms' CSR performance and its stock return, but no significant association between CSR performance and beta.

An empirical study of 451 UK firms was conducted by Brammer et al. (2006). Apart from a negative relationship between corporate social performance and financial performance (see 3.3 Stock Market Returns), they found no significant correlation between CSR performance and beta. Brammer et al. (2006) argued that standard risk-based models could not reveal an explanation for the great differences in returns between high and low CSR rated firms.

Furthermore, Bassen et al. (2006) carried out another more international empirical study. They analysed the effect of CSR ratings on the risk profiles of 44 utility companies from 23 developed countries (2000-2005). Although no significant association between CSR and financial performance could be found, an indirect link through company risk was proven. More precisely, their results showed a significant negative relationship between CSR performance and beta. In addition, results provided evidence that CSR performance had explanatory power for credit ratings, a measure of default risk, too. Bassen et al. (2006) concluded that high levels of CSR performance reduced a firm's risk exposure.

A global analysis was conducted by Lee and Faff (2009). Their sample comprised 2,500 firms from 34 countries and 5 years (1998-2002). They used the DJSI as CSR performance measure and the Dow Jones Global Index (DJGI), which included all DJSI firms, as firm selection for the whole sample. Although the high CSR portfolio did not underperform the market portfolio, the low CSR portfolio outperformed the market and the CSR portfolio. However, Lee and Faff found that firms with high levels of CSR performance faced significantly lower idiosyncratic – not systematic – risk than firms

with low levels. Further, their results showed that idiosyncratic risk had significant explanatory power for the difference in stock performance between high and low CSR rated firms.

Hence, voluntary social disclosure as well as CSR ratings and equity beta tend to be negatively correlated. Higher levels of environmental responsibility and corporate governance can reduce a firm's risk profile and hence equity beta. Although CSR performance and beta are negatively associated, accounting-based risk measures seem to have better explanatory power regarding CSR. The fact that a firm is in a sin industry seems to have no effect on its beta. Unlike firms in the U.S., firms in Europe do not show a significant association between CSR performance and beta, the same holds true for a study of solely UK firms. On one hand, an international analysis for firms in the utility industry has shown that CSR performance and beta are negatively and highly correlated. On the other hand, a global cross-industry study has provided evidence that idiosyncratic, and not systemic risk, can explain the financial performance difference between high and low rated firms. Spicer (1978) raised the question whether the valuation effect of CSR performance on a firm's risk profile was just not short-lived and better reflected the current Zeitgeist.

### **3.6 Meta-analyses**

The above subchapters presented individual empirical research studies on the relationship between CSR performance and financial performance, either based on figures from stock markets or accounting. They showed a lot of inconclusive results – finding significant positive, negative, non-significant or no relationships at all. A meta-analysis, might shed more light on the issue. The main advantage of such an analysis is that sampling errors can be reduced and the sample covers a longer time period and more industries and countries.

This was the purpose of the study by Orlitzky et al.(2003), who conducted a meta-analysis comprising 52 studies, 33,878 observations with a time frame of 26 years (1972-1997). Six of the above 37 presented studies, have been also included in this meta-analysis. The results showed a significant positive relationship between financial and CSR performance across industries and study contexts. However, environmental performance had a much smaller correlation with financial performance than overall CSR or social performance. Furthermore, CSR and financial performance seemed to have simultaneous and bidirectional causality, hence, supporting the suggestions of Gregory et al. (2010) and Waddock and Graves (1997) of a virtuous circle. Orlitzky et

### 3.6 Meta-analyses

al. (2003) argued that this in turn supported the theories of instrumental stakeholders and of slack resources. Their results also showed that high CSR performance increased reputation and goodwill, though the reputation effect was rather small. Overall, the authors conclude that financial performance based on accounting figures, rather than on stock market measures, tended to be higher correlated with CSR performance. This finding was additionally supported by the empirical evidence from Gregory et al. (2011c) (see 3.5 Risk Premium).

Another meta-analysis carried-out by Margolis et al. (2007) comprised 167 studies over a time period of 36 years (1972-2007). Ten of the above 37 presented studies, were also included in this meta-analysis. Their empirical study provided evidence that CSR and financial performance were positively associated. This link was strongest for environmental performance, charitable contributions and revealed misdeeds. This association was also found by Cohen et al. (1997), Sharfman and Fernando (2008), Brammer and Millington (2008), Lev et al. (2010), as well as Rao (1996), Gregory et al. (2011c), Gregory et al. (2011b) and Chava (2010), respectively. Moreover, the link was weakest for corporate policies and transparency. However, the effect was smaller in respect to increased financial performance following CSR performance, and stronger for high financial performance prior CSR performance. Margolis et al. (2007) argued that the weak effect on subsequent financial performance could be due to avoidance of a firm to get socially criticised, but was still low enough not to incur great costs. They explained the latter (stronger) effect through free cash flows, which were in their opinion wasted investments. Overall, the authors found no systematic negative effect of CSR on financial performance. They suggested, that the steady interest in searching a possible association between CSR and financial performance might root in the need of business leaders to justify CSR costs and the effort to find a “deeper purpose that business serves for society” while suspending or violating the duty of pursuing a firm’s financial objectives.

Hence, both meta-analysis agree that corporate social performance helps to build a firm’s reputation and that there is a positive association between financial and CSR performance. However, in regard to environmental performance, there are inconclusive results. While Orlitzky et al. (2003) has found evidence for environmental performance having a much smaller correlation with financial performance, Margolis et al. (2007) has shown contrary evidence. They seem to disagree in respect to causality as well. On one hand, Orlitzky et al. (2003) has found a bidirectional and simultaneous influence, like a virtuous circle, whereas Margolis et al. (2007) only has found a “mild”

effect of prior CSR performance on subsequent financial performance, and a much stronger one in the opposite direction. Moreover, both studies seem to agree that financial resources are necessary to engage or improve CSR performance and support the slack resource or free cash flow theory respectively. Overall, Orlitzky et al. (2003) concluded that financial performance, measured with accounting rather than stock market figures, had a higher significant correlation with CSR ratings. By contrast, Margolis et al. (2007) argued that the association between CSR and financial performance was rather weak and encouraged the investigation of the behaviour behind CSR performance.

## 3.6 Meta-analyses

## 4 Hypotheses

After presenting theoretical approaches and related studies regarding CSR performance and cost of equity capital, two hypothesis will be discussed for the empirical study. The first will examine the impact of CSR ratings on equity beta, while the second will assess a possible relation between CSR ratings and stock liquidity.

### 4.1 Capital Markets Reward High CSR-Rated Firms With Lower Betas

The theories and empirical studies presented in the preceding chapters suggest that CSR activities enhance the long-term value of a firm. Furthermore, CSR disclosure reduces information risk due to a higher degree of transparency. The reduction of uncertainty also lowers the premium required from capital markets. Particularly the commitment to CSR disclosure decreases a firm's cost of capital. More analysts get attracted by more information available; they perceive CSR as value creating strategy and hence, they are more likely to recommend firms with higher CSR performance.

Various studies, including Gregory et al. (2010), Sharfman and Fernando (2008), Gregory et al. (2011a), McGuire et al. (1988), as well as El Ghouli et al. (2011) have already provided empirical evidence that equity beta is significantly negatively correlated with CSR ratings.

Based on the previously presented theoretical and empirical studies, the first hypothesis of the empirical analysis is:

*Hypothesis 1: Capital markets reward high CSR-rated firms with lower cost of equity capital, measured by equity beta.*

### 4.2 CSR Reporting Firms Enjoy Increased Stock Liquidity

CSR ratings are based on publicly disclosed information from the company. Thus, with higher levels of CSR disclosures the information asymmetry between management and investors declines (see 2.2.3 Costs and Benefits of CSR). Leuz and Verrecchia (2000) showed that voluntary disclosure increases stock liquidity. Moreover, institutional investors get increasingly under pressure to invest in SRI stocks and thus increase liquidity of these stocks. Hence, the second hypothesis of the empirical analysis is:

*Hypothesis 2: CSR reporting firms enjoy increased stock liquidity.*

## 4.2 CSR Reporting Firms Enjoy Increased Stock Liquidity

## 5 Dataset and Methodology

In this chapter all the data and methodology used for the empirical study to test the above discussed hypotheses will be presented. First, the sample for both hypotheses will be described. Second, the dependent variable for measuring cost of equity capital and liquidity will be presented, as well as the influencing variables, id est. CSR ratings and control variables. Third, the statistical methods, namely a linear regression model as well as a variance analysis, will be outlined.

### 5.1 Sample Description

The empirical study originally aimed at investigating a possible relationship between cost of equity capital and CSR ratings of Austrian and German stock listed firms; however, due to methodological constraints, only the German firms were included in the final sample. The composition of the sample depended on the data provided by a rating agency, *oekom research AG*.

#### 5.1.1 Corporate Social Responsibility Performance

Most of the studies presented in chapter 3 used ratings on environment, social and governance performance (KLD ratings) from *MSCI Inc* as a CSR performance measurement. However, due to the fact that the sample was supposed to comprise only German and Austrian companies, a German rating agency, *oekom research AG*, was asked to provide its ratings. *oekom research AG* was very cooperative and disclosed top level scores of Austrian and German companies per June 30, 2012 for this master thesis.

Generally, *oekom research AG* evaluates around 3,100 companies covering major indexes as the MSCI world index, MSCI emerging markets index, Stoxx 600, but also ATX (Austrian stock exchange index) and DAX (German stock exchange index). However, firms in “sin industries”, id est firms operating in controversial business areas or with controversial business practices, are not evaluated; controversial business areas include: abortion, alcohol, biocides, chlororganic mass products, embryonic research, furs, gambling, genetically modified organisms, military, nuclear power, pornography and tobacco. Controversial business practices comprise: animal testing, business malpractice, child labour, controversial environmental practices as well as human and labour rights violations. Leading firms regarding CSR ratings within their respective industries, which meet a specific minimum of criteria receive the *oekom research* prime status, which were about 550 firms per June 30, 2012. Furthermore,

## 5.1 Sample Description

*oekom research AG* has its own Global Challenges Index (GCX) with the 50 globally active companies and SMEs that promote sustainable development. Twelve of these 50 firms are from Germany (10) and Austria (2) (*oekoem research AG*, 2012).

*oekom research AG* follows the “Frankfurt-Hohenheims Guidelines” for the ethical assessment criteria and rates a firm’s social, cultural and environmental sustainability. Information for their ratings come from annual and sustainability reports, interviews with firm representatives and independent experts, media screening as well as assessments from independent specialists. The ratings cover the following six main areas: 1) employees and suppliers, 2) society and product responsibility, 3) corporate governance and business ethics, 4) environmental management, 5) products and services, and 6) eco-efficiency. While the first three (1-3) criteria are social performance criteria, the latter three (4-6) are environmental criteria. The ratings are on a twelve-scale from A+ with “extraordinary performance” to D- “little engagement”(oekom research AG 2012).

Overall, *oekom research AG* rated 141 German (114) and Austrian (27) firms per June 30, 2012. However, not all of these rated companies are also listed on a stock exchange and hence, 30 firms had to be excluded from the sample. The ratings (*RATING*) of these Austrian and German firms ranged from A to C-. In addition to the twelve-scale ratings, *oekom research AG* defined four groups: excellent (A+, A, A-), good (B+, B, B-), medium (C+, C, C-) and poor (D+, D, D-) (*oekom research AG*, 2012).

Moreover, *oekom research AG* differentiates between different industries and hence, puts different weights on social and environmental ratings for different industries for the overall corporate rating (*oekom research AG* 2012).

### 5.1.2 Financial Performance

Equity beta was used to measure cost of equity capital. The sample had to be reduced to German companies for least influence by country characteristics. However, the exclusion of 15 Austrian firms did not reduce the sample considerably. Thus the final sample consisted of 94 German companies.

The data for leverage of four German firms was not available for the specific time period in the *Bloomberg* database. Hence, for the regression analyses with control variables, the sample size was reduced to 90 firms. The other parameters serving as

control variables – namely size, liquidity and industry – were available for all firms, and thus, did not affect sample size.

### 5.1.3 Sample Characteristics

The final sample comprised 94 German firms listed on a stock exchange in Germany. More than half of the sample firms (52) were companies with large market capitalisation values (“large caps”), which were part of a leading international/national share index. The remaining 42 firms had small to medium market capitalisation values, but according to *oekom research AG* significantly contributed to sustainability development. Furthermore, ten of the sample firms were included in the Global Challenges Index by *oekom research AG* (see chapter 5.1.1).

*oekom research AG* also provided an industry classification. The sample covered 36 different industries with one to four firms being assigned to each industry. The only exception was the industry “renewable energy and energy efficiency” comprising one third of the sample (31 firms).

Detailed sample description, id est descriptive statistics of equity beta, ratings, as well as size, liquidity and leverage will be provided in chapter 6.1 Study Sample Characteristics.

## 5.2 Description of Variables

Cost of equity capital might be influenced by CSR performance, thus equity beta was used as dependent variable and CSR ratings as influencing variable. Other factors can influence equity beta, like measures of leverage, liquidity and size as well as industry dummies, these were used as control variables. The measure for liquidity was further used for the second analysis to investigate a possible association between CSR ratings and liquidity too.

### 5.2.1 Cost of Equity Capital

Equity beta was used as the measure of firms’ cost of equity capital. More precisely, the two-year average equity betas from *Bloomberg* were used. *Bloomberg* averages the weekly raw equity beta (104) to calculate the two-year average. The time period for the calculation is June 30, 2010 until June 30, 2012.

The advantage of using equity beta instead of any other measure of cost of equity capital is that it is not heavily relying on analyst forecasts and easily comparable. Calculating the cost of equity capital by using CAPM and equity beta would bear too

## 5.2 Description of Variables

many uncertainties about the market premium and risk free rate for Austria and Germany. Therefore, equity beta (*BETA*) was used for measuring cost of equity capital for better comparability.

### 5.2.2 Corporate Social Responsibility Ratings

*oekom research AG* rates companies from the best grade A+ to D-. In order to properly perform regression analyses, numbers were assigned to each rating grade in an ascending order (1 for A+, 12 for D-). This is particularly important to be kept in mind when interpreting the results.

For a robustness test, ratings were grouped (*RATING\_GR*) and used for another regression analysis. Due to the fact that only end ratings were available, no in-depth analysis of individual rating components have been performed.

### 5.2.3 Control Variables

Since a firm's equity beta is also influenced by other factors such as leverage and liquidity, the following four control variables were included in the regression analysis:

#### *Leverage*

Leverage has a direct effect on a firm's cost of equity capital, as an increased debt to equity ratio increases a firm's default risk and hence increases its cost of equity capital too (see 2.1.2 Capital Asset Pricing Model and Cost of Equity Capital). Bhandari (1988) suggested that leverage is a proxy for equity risk. In addition, Hong and Kacperczyk (2009), El Ghouli et al. (2011) as well as Sharfman and Fernando (2008) used leverage as a control variable in their examination of a relationship between equity beta and CSR performance.

Hence, in the empirical study leverage (*LEVERAGE*), measured as total debt to common equity per June 30, 2012 from *Bloomberg* database, was used as control variable.

#### *Firm Size*

The size of a firm can have an important effect on a firm's capital costs. Banz (1981) found that firm size influences cost of capital due to the fact that of small firms less information is available. Moreover, Fama and French (1993) stated that returns of small firms are much more variable than of larger firms. Besides, according to Waddock and Graves (1997) there is evidence that smaller firms do not overtly show as much CSR behaviour compared to larger firms. Moreover, larger firms generally have more

resources to invest in CSR (Sharfman and Fernando, 2008). There are various ways to measure a firm's size. Bassen et al. (2006) as well as Waddock and Graves (1997) used the number of employees as the size control variable. In comparison, El Ghouli et al. (2011) and Spicer (1978) measured a firm's size as the natural logarithm of total assets, whereas Sharfman and Fernando (2008) controlled for firm size with market capitalisation from *Bloomberg* database. Around half of all studies included in Margolis et al.'s meta analysis (2007) that used size as a control variable.

Thus, for the empirical analysis, a control variable for size (*SIZE*) was used and measured with market capitalisation per June 30, 2012 from *Bloomberg* database.

### *Liquidity*

When a firm is more liquid, its beta is lower too (see 2.1.2 Capital Asset Pricing Model and Cost of Equity Capital). Amihud and Mendelson (1986) suggested that liquidity is a good proxy for beta. Hence, when examining the relationship between beta and CSR performance, liquidity is an important control variable. For example Dhaliwal et al. (2011) used liquidity, measured as number of traded shares over total shares outstanding.

In the regression analysis, the control variable liquidity (*LIQUIDITY*) was measured as the ratio of trading volume to total equity shares outstanding per June 30, 2012 from *Bloomberg* database.

### *Industry Classification*

Firms in different industries might systemically face different costs of capital (Sharfman and Fernando, 2008). Furthermore, some differences in risk, reflected in beta, may be due to industry effects (Gregory et al., 2010). According to Margolis et al. (2007), 75 of the examined 167 studies from their meta-analysis used control variables for industries.

Industry dummies (*INDUSTRY*) were included in the regression analysis to control for such industry effects. The industry classification was used according to the classification of *oekom research AG*, consisting of 35 different industries (see Appendix 1: List of Industries).

#### **5.2.4 Stock Liquidity**

Cheng et al. (2012) stated that we need to understand how capital markets perceive and value volunteer CSR initiatives. Hence, another interesting research question that was developed asked whether firms with high CSR performance were preferred by

### 5.3 Statistical Methods

markets than those with lower performance. This could be measured in various ways, exempli gratia in terms of trading activity, or more precisely liquidity. None of the previously conducted studies presented in chapter 3 or included in the meta-analysis performed by Margolis et al. (2007) examined the relationship between liquidity and CSR ratings.

Thus, in addition to the examination of the link between CSR ratings and equity beta, a regression analysis was conducted to investigate a possible relationship between CSR ratings and liquidity. The liquidity measure (*LIQUIDITY*) used as a control variable in the first regression – ratio of the number of traded shares to total shares outstanding – was used as the dependent variable for the second analysis.

### 5.3 Statistical Methods

In order to test the in chapter 4 described hypotheses, a linear regression model was applied for investigating a possible association between CSR ratings and equity beta as well as liquidity. Furthermore, an analysis of variance (ANOVA) was performed to test the difference in means of the dependent variables between the three rating groups included in the sample. A level of significance with five percent was assumed. All statistical analyses were carried out with the help of the PAWS Statistics software (Version 18 for Windows).

#### 5.3.1 Cost of Equity Capital: Beta

First, a linear regression with equity beta (*BETA*) as dependent variable and CSR rating (*RATING*) as influencing variable without any control variables was performed. Another linear regression but with additional influencing variables controlling for leverage (*LEVERAGE*), size (*SIZE*), liquidity (*LIQUIDITY*) and industry effects (*INDUSTRY*) was carried out. As a robustness test, a linear regression with the same dependent and control variables, but with group ratings (*RATING\_GR*) instead of individual ratings (*RATING*), was conducted.

Moreover, a oneway ANOVA for the variables beta (*BETA*), leverage (*LEVERAGE*), size (*SIZE*) and liquidity (*LIQUIDITY*) in regard to group ratings (*RATING\_GR*) was conducted. In case of non-homogeneity of variances, results were Welch-corrected. A post-hoc Tukey Test was performed to further investigate significant differences found in the ANOVA. Due to the fine classifications of industries – 90 firms in 35 different industries –, the industry dummies were omitted for the ANOVA.

### **5.3.2 Stock Liquidity**

In addition to examining the correlation between CSR ratings and equity beta, a possible association between CSR ratings and liquidity was investigated. This was done by means of a linear regression, with liquidity (*LIQUIDITY*) as the dependent variable and CSR rating (*RATING*) as the influencing variable. Unlike the regression with beta, for this analysis no control variables were used.

## 5.3 Statistical Methods

## 6 Results

In this chapter the results of the empirical study will be presented. First, sample characteristics for both hypotheses will be displayed. Second, the regression analyses regarding equity beta will be presented, followed by the results of the ANOVA. Finally, the results of the investigation of a possible association between CSR ratings and liquidity will be depicted.

### 6.1 Study Sample Characteristics

Overall there have been four variables and 35 dummy variables used for the regression analyses. The total sample consisted of 94 firms, though for the analyses with all control variables the sample size has been reduced to 90 due to missing data for the variable *LEVERAGE*. In the following table (Table 1), the descriptive statistics of the sample are summarised:

**Table 1: Descriptive statistics of *BETA*, *SIZE*, *LIQUIDITY* and *LEVERAGE***

	Mean	Standard deviation	N	Minimum	Maximum
BETA	.6845	.41917	94	-.10	1.81
SIZE	7.2668E9	1.33725E10	94	32.95	6.05E10
LIQUIDITY	1.0995	.91088	94	.00	4.70
LEVERAGE	220.1515	399.78651	90	2.06	2154.09
Valid values			90		

Table 2 shows the distribution of individual ratings among the sample firms. While column 2 and 3 refer to the total sample, column 4 and 5 refer to the reduced sample. Only a few firms had top (A) and bottom ratings (C-) . Almost half of the firms were either rated B- or C+.

**Table 2: Descriptive statistics of *RATINGS***

		n	%
valid	A+	0	0.0
	A	1	1.1
	A-	6	6.4
	B+	12	12.8
	B	11	11.7
	B-	20	21.3

## 6.2 Cost of Equity Capital: Beta

	n	%
C+	24	25.5
C	17	18.1
C-	3	3.2
D+	0	0.0
D	0	0.0
D-	0	0.0
total	94	100.0

In addition, Table 3 displays the distribution of group ratings. Like individual ratings, most firms had neither top (excellent) nor bottom (poor) ratings. The rating groups “good” and “medium” were nearly equally often presented.

**Table 3: Descriptive statistics of *RATING\_GR***

	n	%
valid excellent	7	7.4
good	43	45.7
medium	44	46.8
poor	0	0.0
total	94	100.0

## 6.2 Cost of Equity Capital: Beta

In this subchapter, the results of the following three linear regression analyses will be presented: first, with individual CSR ratings but without control variables; second, with individual ratings and all four control variables; third, with group ratings and all four control variables. Moreover, the results of an ANOVA for the group ratings will be displayed.

### 6.2.1 Linear Regression without Control Variables

At first, a linear regression was performed with equity beta (*BETA*) as the dependent variable and CSR ratings (*RATING*) as influencing variable. Table 4 shows the basic statistical characteristics of the sample. All 94 observations were included in the sample. *BETA* had a mean of 0.6845 and *RATING* a mean of 6.1064 (equivalent to B-).

**Table 4: Descriptive statistics of linear regression (without control variables)**

	Mean	Standard deviation	N
BETA	.6845	.41917	94
RATING	6.1064	1.62949	94

The results of the regression analysis, presented in table 5, showed a significant positive correlation between the two variables. Also the regression coefficient was, although only slightly positive, statistically significant. Importantly, the signs must be interpreted the other way around, taking into account that the best possible rating A+ was assigned number 1 and the worst D- number 12. Hence, the better a firm's CSR rating, the lower its equity beta. It must be noted that based on these results a causality cannot be interpreted.

**Table 5: Correlations and regression coefficients (without control variables)**

		Correlations		Regression coefficient <sup>a</sup>
		BETA	RATING	
Pearson correlation	BETA	.386	1.000	.099
	RATING	1.000	.386	
Significance	BETA	.000	.	.000
	RATING	.	.000	

a. Dependent variable: BETA

### 6.2.2 Linear Regression with Control Variables

A second linear regression with the four control variables was performed. Table 6 displays the basic statistical characteristics of the reduced sample as well as all control variables, excluding the 35 industry dummies. The mean of *BETA* was 0.6856 and of *RATING* 6.1000 (equivalent to B-).

**Table 6: Descriptive statistics of linear regression (with control variables)**

	Mean	Standard deviation	N
BETA	.6856	.42733	90
RATING	6.1000	1.64248	90
SIZE	7.3331E9	1.35081E10	90
LIQUIDITY	1.1026	.90840	90
LEVERAGE	220.1515	399.78651	90

## 6.2 Cost of Equity Capital: Beta

After controlling for *LEVERAGE*, *SIZE*, *LIQUIDITY* and industry effects (*INDUSTRY*), the correlation between equity beta and CSR ratings remained unchanged – positive and significant (see Table 7). However, the regression coefficient was (though positive) statistically not significant. As expected, the results showed that *SIZE* and *LIQUIDITY* strongly affected *BETA*. While size had a negative influence, liquidity had a positive influence. Therefore, in respect to the study sample, CSR ratings had no explanatory power for equity beta, but were moderately positively correlated.

**Table 7: Correlations and regression coefficients (with control variables)**

		Correlations					Regression coefficient <sup>a</sup>
		BETA	RATING	SIZE	LIQUIDITY	LEVERAGE	
Pearson Correlation	BETA	1.000	.388	.332	-.047	.498	.
	RATING	.388	1.000	.182	.145	-.041	.053
	SIZE	.332	.182	1.000	.073	.101	1.190E-11
	LIQUIDITY	.498	-.041	.101	1.000	-.024	.188
	LEVERAGE	-.047	.145	.073	1.000	-.024	.000
Significance	BETA	.	.000	.001	.331	.000	.
	RATING	.000	.	.043	.086	.352	.121
	SIZE	.001	.043	.	.246	.171	.012
	LIQUIDITY	.000	.352	.171	.410	.	.000
	LEVERAGE	.331	.086	.246	.	.410	.037

a. Dependent variable: BETA; Additional control variables: INDUSTRY

### 6.2.3 Linear Regression with Group Ratings and Control Variables

For a robustness check, rating grades were grouped according to the classification by *oekom research AG*. Besides, eleven, or rather eight represented, rating grades were a lot for a sample of 90 firms.

Table 8 depicts the basic statistical characteristics without industry dummies. Group ratings (*RATING\_GR*) had a mean of 2.3889 (equivalent to “good”).

**Table 8: Descriptive statistics for regression analysis (group ratings)**

	Mean	Standard deviation	N
BETA	.6856	.42733	90
SIZE	7.3331E9	1.35081E10	90
LIQUIDITY	1.1026	.90840	90
LEVERAGE	220.1515	399.78651	90
RATING_GR	2.3889	.63058	90

Table 9 shows the results of the regression analysis for group ratings and equity beta. Alike with individual ratings, *RATING\_GR* and *BETA* were positively and significantly correlated. *LIQUIDITY* and *SIZE* were strongly positively and significantly correlated with *BETA* as well. However, controlling for size, liquidity, leverage and industry effects, no significant regression coefficient was revealed for *RATING\_GR* and *BETA*. This finding showed that CSR ratings, no matter how finely or roughly classified, had no influence on equity beta but were significantly moderately positively correlated. Not surprisingly, the regression analysis confirmed a strong and significant influence of *SIZE* and *LIQUIDITY* on *BETA*.

**Table 9: Correlations and regression coefficients (group ratings)**

		Correlations					Regression coefficients <sup>a</sup>
		BETA	SIZE	LIQUIDITY	LEVERAGE	RATING_GR	
Pearson correlation	BETA	1.000	.332	.498	-.047	.316	.
	SIZE	.332	1.000	.101	.073	.032	1.233E-11
	LIQUIDITY	.498	.101	1.000	-.024	-.093	.195
	LEVERAGE	-.047	.073	-.024	1.000	.125	.000
	RATING_GR	.316	.032	-.093	.125	1.000	.151
Significance	BETA	.	.001	.000	.331	.001	.
	SIZE	.001	.	.171	.246	.381	.009
	LIQUIDITY	.000	.171	.	.410	.192	.000
	LEVERAGE	.331	.246	.410	.	.119	.049
	RATING_GR	.001	.381	.192	.119	.	.070

a. Dependent variable: BETA; Additional control variables: INDUSTRY

## 6.2 Cost of Equity Capital: Beta

### 6.2.4 Analysis of Variance (ANOVA)

The oneway ANOVA measured the homogeneity of means between the three rating groups. In Table 10, the results of the performed ANOVA are presented. The ANOVA showed significant differences in BETA between the three rating groups, but not in the other tested variables *SIZE*, *LIQUIDITY* and *LEVERAGE*.

**Table 10: Oneway ANOVA**

		Sums of squares	df	Mean squares	F	Significance
SIZE	Between groups	5,781E20	2	2,891E20	1,639	,200
	Within groups	1,605E22	91	1,764E20		
	Total	1,663E22	93			
LIQUIDITY	Between groups	2,367	2	1,183	1,440	,618*
	Within groups	74,795	91	,822		
	Total	77,162	93			
LEVERAGE	Between groups	274111,165	2	137055,582	,855	,429
	Within groups	1,395E7	87	160352,788		
	Total	1,422E7	89			
BETA	Between groups	1,652	2	,826	5,119	,008
	Within groups	14,688	91	,161		
	Total	16,340	93			

Table 11 shows that only the means of the rating groups “good” and “medium” significantly differed from each other. There was no significant difference in means between the groups “excellent” and “good” nor “excellent” and “medium”. However, group “excellent” comprising less than ten percent of the sample is not really representative and, so the result has to be interpreted with caution.

**Table 11: Differences in means between rating groups**

Dependent variable	(I) RATING_GR	(J) RATING_GR	Mean Difference (I-J)	Standard deviation	Significance	95%-confidence interval	
						Lower limit	Upper limit
SIZE	excellent	good	-9,26566E9	5,41317E9	,206	-2,2163E10	3,6321E9
		medium	-6,35009E9	5,40455E9	,471	-1,9227E10	6,5271E9
	good	excellent	9,26566E9	5,41317E9	,206	-3,6321E9	2,2163E10
		medium	2,91557E9	2,84806E9	,564	-3,8704E9	9,7015E9
	medium	excellent	6,35009E9	5,40455E9	,471	-6,5271E9	1,9227E10
		good	-2,91557E9	2,84806E9	,564	-9,7015E9	3,8704E9
LIQUIDITY	excellent	good	,62700	,36950	,212	-,2534	1,5074
		medium	,54316	,36891	,309	-,3358	1,4222

Dependent variable	(I)	(J)	Mean Difference (I-J)	Standard deviation	Significance	95%-confidence interval	
						Lower limit	Upper limit
	good	excellent	-,62700	,36950	,212	-1,5074	,2534
		medium	-,08384	,19441	,903	-,5470	,3794
	medium	excellent	-,54316	,36891	,309	-1,4222	,3358
		good	,08384	,19441	,903	-,3794	,5470
LEVERAGE	excellent	good	-163,02048	163,76381	,582	-553,5119	227,4710
		medium	-210,96373	163,47925	,404	-600,7767	178,8492
	good	excellent	163,02048	163,76381	,582	-227,4710	553,5119
		medium	-47,94325	87,91454	,849	-257,5737	161,6872
	medium	excellent	210,96373	163,47925	,404	-178,8492	600,7767
		good	47,94325	87,91454	,849	-161,6872	257,5737
BETA	excellent	good	-,11289	,16374	,770	-,5030	,2773
		medium	-,35655	,16348	,080	-,7461	,0330
	good	excellent	,11289	,16374	,770	-,2773	,5030
		medium	-,24366 <sup>*</sup>	,08615	,016	-,4489	-,0384
	medium	excellent	,35655	,16348	,080	-,0330	,7461
		good	,24366 <sup>*</sup>	,08615	,016	,0384	,4489

\* Difference in means is significant (at level 0.05).

### 6.2.5 Synopsis of Results

The below table 12 summarises the main results of the above described tests. Statistical significance is marked with two and one stars denoting one and five percent level of significance, respectively. The table shows that CSR ratings and equity beta were positively and significantly correlated, regardless of the composition of the analyses. However, after controlling for major influencing factors relating to beta, the positive regression coefficient between CSR ratings and equity beta was statistically non-significant.

**Table 12: Synopsis of results**

Type of Regression	Correlation (beta-rating)	Regression coefficient (beta-rating)	Other significant coefficients
Individual ratings, without control variables	0.386 (0.000)	0.099 (0.000)	
Individual ratings, with control variables	0.388 (0.000)	0.053 (0.121)	Size (1.190E-11), liquidity (0.188), leverage (0.000)
Group ratings, with control variables	0.316 (0.001)	0.151 (0.070)	Size (1,233E-11), liquidity (0.195), leverage (0.000)

### 6.3 Stock Liquidity

Type of Regression	Correlation (liquidity-rating)	Regression coefficient (liquidity-rating)	
Liquidity	-0.032 (0.380)	-0.018 (0.760)	

### 6.3 Stock Liquidity

In addition to the examination of the relationship between CSR ratings and equity beta, a linear regression analysis was performed to investigate a possible association between CSR ratings and liquidity. This regression was carried out without control variables. Table 13 displays the basic statistical characteristics of the dependent variable, *LIQUIDITY*, and the influencing variable, *RATING*. The mean of *LIQUIDITY* was 1.0995 and the mean of *RATING* 6.1064 (equivalent to B-).

**Table 13: Descriptive statistics for linear regression (*RATING-LIQUIDITY*)**

	Mean	Standard deviation	N
LIQUIDITY	1.0995	.91088	94
RATING	6.1064	1.62949	94

Table 14 presents the regression analysis results for CSR ratings and liquidity. Although *LIQUIDITY* and *RATING* could have a positive association, there is neither a statistically significant correlation nor regression coefficient for the two variables. Hence, more liquid firms tend to have higher CSR ratings, but the results suggest that CSR ratings have no direct influence on a firm's liquidity.

**Table 14: Correlations and regression coefficients (*RATING-LIQUIDITY*)**

		Correlations		Regression coefficient
		LIQUIDITY	RATING	
Pearson correlation	LIQUIDITY	1.000	-.032	.018
	RATING	-.032	1.000	
Significance	LIQUIDITY	.380	.760	.760
	RATING	.380	.760	

a. Dependent variable: LIQUIDITY

## 7 Discussion and Conclusion

In this chapter the results of the empirical analysis presented in the preceding chapter (see 6 Results) will be discussed and interpreted, followed by a critical assessment of the study. This chapter and the thesis will be closed with concluding remarks.

### 7.1 Discussion of the Results

The results presented in chapter 6 Results will be discussed in detail with referring to theoretical approaches addressed in chapter 2 Theoretical Background as well as to related studies introduced in chapter 3 Related Research.

#### 7.1.1 Cost of Equity Capital: Beta

Three similar linear regression analyses were conducted: 1) one with individual CSR ratings and without control variables, 2) one with individual ratings and control variables, and 3) one with grouped CSR ratings and control variables. Moreover, an ANOVA for individual ratings and control variables was performed.

##### *Linear Regression without Control Variables*

The results, showing a significant negative relationship<sup>7</sup> between CSR ratings and equity beta, would suggest that firms with high levels of CSR performance enjoy low equity betas and hence, low cost of equity capital. Moreover, the highly significant coefficient could indicate that an increase in a firm's CSR rating could lower its equity beta. These results would support the results of most of the previously presented studies (Anderson and Frankel, 1980; Gregory et al., 2010; Sharfman and Fernando, 2008; Gregory et al.; 2011a; El Ghouli et al., 2011; McGuire et al., 1988; Spicer, 1978; and Bassen et al., 2006).

However, these results have to be interpreted with caution, because no control variable has been used, which possibly could affect beta and override the explanatory power of CSR ratings. As the results of the second regression show, this was exactly the case in my study.

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<sup>7</sup> Due to the assignment of numbers to the ratings, the signs in front of the results have to be viewed the other way around – a positive relationship is supposed to be a negative and vice versa.

## 7.1 Discussion of the Results

### *Linear Regression with Control Variables*

After controlling for leverage, liquidity, firm size and industry effects, the results for CSR ratings have changed remarkably. Although the correlations between equity beta and ratings have remained highly significant and modest, the regression coefficient has become statistically non-significant. Firm size and liquidity have yielded sizeable and significant negative correlations as well as regression coefficients. Whereas leverage and equity beta had positive but not statistically significant correlations and no significant regression coefficient.

Thus, these results do not support the main tenor that there is a negative relationship between CSR ratings and equity beta. However, they support some of the studies presented in chapter 3 (see 3.5 Risk Premium); exempli gratia by Ziegler et al. (2002) who found no effect from CSR ratings on beta, or Brammer et al. (2006) who could not detect any correlation between ratings and beta. Lee and Faff (2009) could not find a relationship between beta and ratings in their study neither. In respect to leverage, also Fama and French (1993) provided empirical evidence that leverage has no explanatory power for equity beta, when tested in combination with firm size and book-to-market ratio (see 2.1.2 Capital Asset Pricing Model and Cost of Equity Capital). Thus, the results of this thesis' study are not unexpected.

Moreover, not all studies have used control variables or just not as many as this thesis' study. Although, in all twelve analyses it has been controlled for size, none controlled for liquidity. Industry effects, leverage and book-to-market ratio have been taken into account infrequently. According to the meta analysis conducted by Margolis et al. (2007), less than half of the investigated studies have used size or industry effects as a control variables. Moreover, no study has considered leverage or liquidity as influencing factors in their analyses.

Regarding CSR ratings, it has to be said that five of the eight studies supporting a negative relationship between equity beta and CSR ratings have been conducted with KLD ratings. All presented studies with KLD data found significant relationships. However, it can therefore not be concluded that one CSR rating is better than the other one or biased in regard to beta. Also the ratings used in this thesis' study might include some sort of bias. *oekom research AG* uses certain exclusion criteria and hence, does not take into account certain industries (see 5.1.1 Corporate Social Responsibility Performance). Therefore, the study sample did not cover all industries, id est the whole market. Moreover, not all ratings and/or rating groups have been equally represented in

the sample. Only less than ten percent of the sample firms were rated excellent (A- and above); no poor-rated firm (D+ and lower) have been included in the sample.

There might be some country bias in the conducted studies too. Seven of the eight studies supporting a correlation have been performed with data of U.S. firms. No study not exclusively using U.S. firm data has found a significant correlation. Exempli gratia Ziegler et al. (2002) has conducted a study with European firms and found no effect on beta; Brammer et al. (2006) has used UK firm data and identified no correlation; and Lee and Faff (2009) have not supported a relation with their international firm sample neither. Hence, it might be possible that mainly U.S. capital markets perceive high levels of CSR performance as risk reducing activities. Though, according to this data, only assumptions can be made. Since different data sources have been used for different geographical areas, comparisons have to be made with caution.

Besides, Hail and Leuz (2006) have provided evidence that a significant relationship between equity beta and disclosure levels only exists for non-integrated markets. Thus, when assuming that primarily CSR disclosure is crucial for the ratings, this thesis' results would confirm this finding as Germany counts to those countries with integrated markets. In addition, the disclosure argument would be generally irrelevant for Germany because firms face mandatory CSR disclosures anyhow (see 1 Introduction). Thus, I think that when all listed German firms are required by law to issue CSR information, the capital market has no rational reason to reward firms differently – when only assessing firms from Germany in isolated form.

In my opinion, in Germany, CSR activities are highly regulated and/or controlled. Environmental issues are regulated by strict rules, social performances are tightly controlled by powerful labour unions and strong employee representatives, and possible governmental problems are treated in the German Corporate Governance Code (Deutscher Corporate Governance Kodex<sup>8</sup>). Hence, it is questionable whether there is any CSR activity beyond regulations that could be long-term firm value enhancing in Germany.

Also Gregory et al. (2010) has raised the question whether CSR exposure is really priced by capital markets. They have argued that they were not sure about CSR exposure being a systemic risk factor and would be consequently reflected in equity betas. I think it is doubtful that firms are less exposed to market risk through higher

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<sup>8</sup>See <http://www.corporate-governance-code.de/> for more information.

## 7.1 Discussion of the Results

levels of CSR performance to such an extent that equity betas are significantly lower; irrespective of type, industry, life cycle, size and capital structure. Due to their empirical results, Lee and Faff (2009) have suggested that CSR performance influences idiosyncratic, rather than systematic, risks of a firm – meaning that firm-specific and not market risk would be affected by CSR exposure. This in turn would not be measured by equity beta. Likewise, Brammer et al. (2006) have argued that standard risk-based models are not able to reveal explanations for the great differences in returns between low and high rated firms.

In this context, maybe equity beta and cost of equity capital calculated with the CAPM would not be the appropriate measures. Brammer et al. (2006) has not found any evidence for a significant relationship between CSR ratings and equity beta, but for social and financial performance. Ziegler et al. (2002) has identified a link between stock returns and CSR ratings as well, but none for beta and ratings. Hong and Kacperczyk (2009) confirmed these results with CSR ratings being related to expected returns, rather than beta.

Regarding equity beta being the appropriate measure for examining a possible link between financial and CSR performance, McGuire et al. (1988) stated that accounting-based performance is stronger correlated with levels of CSR than market-based performance. Orlitzky et al. (2003), who conducted a meta analysis of 52 studies comprising 33,878 observations, support this view as well. They have argued that accounting figures tend to be higher correlated with CSR performance than stock market figures.

In respect to the view of Greening and Turban (2000) that high levels of CSR performance can constitute a competitive advantage for a firm can neither be confirmed nor opposed by this thesis' results. Since only ratings of one period have been used to test the two hypotheses, a study covering multiple periods would be qualified for making assumptions to this effect. A good reputation can be seen as one of a firm's competitive advantages. Orlitzky et al. (2003) have suggested that the reputation effect of CSR activities is rather low.

### *Linear Regression with Group Ratings and Control Variables*

The results from the linear regression with group ratings and control variables might be considered as a robustness check of the prior analysis with individual ratings. They confirm the above presented results of CSR ratings having a strong correlation but no

explanatory power on equity beta. Thus, CSR performance and beta go in the opposite direction, but some unknown third factor might influence them both. Therefore, the influence of CSR ratings on liquidity has been tested for the second hypothesis (see 4.2 CSR Reporting Firms Enjoy Increased Stock Liquidity, and 7.1.2 Stock Liquidity).

### *Analysis of Variance (ANOVA)*

The ANOVA shows that neither in firm size, not liquidity or leverage, the means differ between the rating groups. For beta means, differences between the groups have been identified. However, only between group “good” and “medium” the differences have been significant. Since the mean difference features a negative sign in front of the result for group “good”, the mean betas for firms with “medium” ratings were higher than for firms with “good” ratings.

Particularly the sample representativeness must be taken into account at this point. While the middle groups “good” (B+, B, B-) and “medium” (C+, C, C-) are approximately well-matched, the side groups “excellent” (A+, A, A-) and “poor” (D+, D, D-) are rarely or not at all represented, respectively. A more equally represented sample would have yielded more representative, id est more valid results in respect to external validity.

### **7.1.2 Stock Liquidity**

In addition to examining the relationship between CSR ratings and equity beta, a linear regression for investigating a possible association between CSR ratings and liquidity has been carried out. While the results show a marginal positive relationship<sup>9</sup> between ratings and liquidity, it is statistically non-significant. The regression coefficient between the two variables is non-significant as well. Thus, a firm’s CSR rating seems to have no influence on its liquidity.

Since, to my knowledge, no such kind of analysis has been conducted yet, there are no results to be objectively compared to. However, McGuire et al. (1988) as well as Orlitzky et al. (2003) both argued that accounting rather than stock market figures are correlated with CSR performance. Liquidity is a stock market-based performance measure. Thus, the results of both hypotheses of this thesis support the findings of McGuire et al. (1988) and Orlitzky et al (2003).

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<sup>9</sup>Due to the assignment of numbers to the ratings, the signs in front of the results have to be viewed the other way around – a positive relationship is supposed to be a negative and vice versa.

## 7.2 Critical Assessment of the Study

The findings by Leuz and Verrecchia (2000) showing that increased voluntary disclosure increases a firm's liquidity would have suggested that higher CSR performance, which includes a higher level of transparency *id est* disclosure, would give rise to liquidity too. The authors have even used German firms for their empirical sample. However, they investigated reporting standards (national vs. international accounting standards), and they used bid-ask spreads to measure liquidity. That the market values and rewards international, hence, more comparable, reporting standards, is expectable. However, this finding is not transferable one by one to CSR disclosure or performance.

Summarised, neither of the two hypotheses could be proven by the performed empirical study. CSR ratings seemed to have no influence; neither on a firm's cost of equity capital, nor on liquidity.

### **7.2 Critical Assessment of the Study**

The empirical study conducted for this thesis provides some evidence that CSR ratings have no statistically significant influence on cost of equity capital – measured by equity beta. In addition, CSR ratings seem not to influence a firm's stock liquidity.

One major advantage of this study is that not the usually used KLD ratings have been used, but from *oekom research AG*. First, since only German firms have been investigated, a rating agency from Germany might have better information access and is an expert of the German market in terms of relevant fields for CSR. Second, conducting similar studies based on the same data will always achieve similar results – different ratings might reduce or avoid certain bias from one agency. In addition, only a few studies have examined European firms; the majority used U.S. firms for their sample.

However, the sample with 90 firms is rather small. This is due to the fact that only German stock listed companies, which had been rated by the rating agency, have been included. Thus, not international generalisation of the results for capital markets can be made, solely the German market is covered. Even for the German market the sample is not big, but its representativeness is average to good because most of the important industries are included.

However, the sample faces some bias due to exclusion criteria from the rating agency. Certain industries – *exempli gratia* “sin industries” – have been excluded from the list of

rated companies. Moreover, no firms rated “poorly” have been represented in the data. Hence, the results definitely contain some upward bias.

Another limitation is the investigated time frame. While most studies used multiple year observations for their studies, this thesis’ analysis covered solely one time period. Thus, the amount of firm-year observations for the same amount of firms is lower in my study. Ioannou and Serafeim (2011) have found that the perception of analysts regarding CSR performance had changed over time. While in earlier years, CSR performance had been treated as value destroying, analysts have started to appreciate and issue favourable recommendations for higher levels of CSR performance. Maybe the rewarding of high CSR performance in Europe/Germany is already diminished or is in a developing stage. A time series analysis with possible trend or development statements cannot be conducted with the used data in this thesis.

It is also questionable whether the choice of equity beta was appropriate for testing the first hypothesis. On one hand, other measurements for cost of equity capital might be more descriptive than beta. On the other hand, two year average raw beta prior the rating instead of subsequent may not fully reflect a possible influence by the rating. Though, CSR performance is not expected to be highly volatile and hence, ratings are not expected to change remarkably. Thus, this limitation has been traded off for the most recent rating.

Additionally, controlling for liquidity when testing a possible relationship between CSR ratings and equity beta has not been conducted before. However, the results show that liquidity has a significant explanatory power for equity beta and that they are strongly and significantly correlated. Therefore, liquidity should be taken into account when investigating associations with beta.

A further contribution of the study is the analysis of the relationship between CSR ratings and liquidity. Although no control variables have been used, the insignificant correlation should not become significant when introducing other influencing variables. Thus, the argument that high levels of CSR performance increase a firm’s stock liquidity and this increase in turn lowers cost of equity capital cannot be supported, not even in the first instance.

## 7.3 Conclusion

### 7.3 Conclusion

Theoretical approaches suggest that increased levels of CSR performance can improve a firm's competitive advantage and reputation which in turn enhances firm value. Moreover, firms that demonstrate being highly social responsible may face higher litigation, competition and political costs. Though, CSR activities may reduce information asymmetries between management and stakeholders, hence decrease contracting costs, costs of conflicts as well as attract institutional investors and analysts. This in turn may give rise to stock liquidity and lowers cost of capital.

Although theoretical frameworks supporting and also rejecting the view of CSR activities lowering a firm's cost of capital, there have been various studies conducted providing empirical evidence of CSR activities as long-term firm value enhancing. They have showed that high levels of CSR performance may lower a firm's financial constraints due to higher levels of disclosure and increased stakeholder commitment. Furthermore, CSR ratings seem to be negatively related with financial distress. In respect to profit, no correlation has been found. The inclusion of a firm in a sustainability index tends to heighten its share price permanently. Regarding stock returns as well as cost of equity capital, only inconclusive results have been achieved. Especially for equity beta, studies have showed inconclusive results. Mainly studies based on U.S. data have found significant relationships, while international and European based studies have a tendency to not confirm this finding.

I think that due to the fact that this thesis' empirical study could not confirm a statistically significant impact of CSR ratings on equity beta neither, CSR performance may affect a firm's cost of capital indirectly. Particularly negative CSR disclosure, no matter by which party issued, can diminish firm value and stock prices. With high CSR performance the risk of negative CSR reputation can be decreased and hence, prevent a possible increase of cost of capital. Any time CSR activities come into effect for a specific occasion, it can be reflected in a firm's financials. Moreover, financial performance and social performance might be interrelated.

Based on the empirical results, no conclusion can be made about causality, meaning that for example CSR ratings influence equity beta. However, in regard of these empirical results, the hypothesis that capital markets reward firms for high CSR ratings with lower cost of equity capital cannot be confirmed. Nevertheless, a moderate negative correlation between the two variables has been found. I have wanted to contribute with this thesis a proof that high CSR performance can actually reduce a

firm's cost of equity capital. But I doubt that high CSR performance itself can noticeably decrease a firm's cost of equity capital after having examined all the above presented studies and conducting an empirical analysis myself.

I would like to close this thesis with citing three Harvard professors who characterised the relationship between profitability and CSR activities as follows: "... *some* firms generate long-term profits from *some* socially responsible activities *some* of the time..." (Reinhardt F., R. Stavins and R. Vietor, 2008, p. 31).

### 7.3 Conclusion

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## 8 References

## **9 Appendices**

### **Appendix 1: List of Industries**

Aerospace & Defence

Auto Components

Automobile

Chemicals

Commercial Services & Supplies

Construction

Construction Materials

Financials/Commercial Banks & Capital Markets

Financials/Exchanges

Financials/Mortgage & Public Sector Finance

Health Care Equipment & Supplies

Health Care Facilities & Services

Household & Personal Products

Industrial Conglomerates

Insurance

IT/Software & Services

Leisure

Machinery

Media

Metals & Mining

Pharmaceuticals & Biotechnology

## 9 Appendices

Real Estate

Recycling & Emissions Reduction

Renewable Energy & Energy Efficiency

Retail

Sustainable Finance

Sustainable Food

Sustainable Materials

Sustainable Services

Sustainable Transportation

Telecommunications

Textiles & Apparel

Transport & Logistics

Transport & Logistics/Rail

Transportation Infrastructure

Utilities

## Appendix 2: Confidentiality Agreement with oekom research AG



### CONFIDENTIALITY AGREEMENT

1. This Agreement between oekom research AG, Germany („OEKOM“) and Valentina Metz, Austria (“Metz“) shall govern the disclosure of confidential information between the parties.
2. OEKOM is willing to disclose to Metz the following data: top level scores of Austrian and German companies (as at 06/2012). OEKOM is the owner of all the information, which is protected by copyright. The information is considered as “Confidential Information”.
3. Metz is allowed to use the Confidential Information solely for her master thesis.
4. Metz, including its employees, officers, directors, agents and subcontractors will hold all Confidential Information in confidence and will not disclose, copy or reproduce in whole or part, whether in written, oral, electronic or any other form Confidential Information to any third party without the prior written consent of OEKOM.
5. Metz will restrict access to the Confidential Information to those officers, employees, subcontractors and agents who are required to have access to the Confidential Information for the preparation of the services as described in section 3 above. Metz shall procure that such parties comply with the terms of this Agreement and be liable for any violation of the terms of this Agreement by such parties.
6. This Agreement shall not preclude Metz from disclosing any information required to be disclosed by valid court order or law or regulation provided that OEKOM is provided with immediate notice of such request.
7. This Agreement will be construed in accordance with German law and the parties hereby submit to the non-exclusive jurisdiction of the Courts in Munich in relation to any matter arising from this letter.

Date: 17 July 2012

Valentina Metz



**Appendix 3: Abstract (English)**

During the last two decades a remarkably growing number of sustainable and responsible investment products have emerged. Increasingly more countries have adapted laws requiring non-financial performance indicators to be disclosed too. Hence, the question arises whether capital markets reward corporate social responsibility (CSR) of firms. These rewards can be in form of lower cost of capital, particularly cost of equity capital.

This thesis contributes to the extensive literature examining the pros and cons of CSR and a possible relationship between CSR and financial performance. An overview of a firm's external financing options and cost of capital is presented. CSR is defined, including a discussion of a firm's responsibility towards its shareholders and stakeholder, and costs and benefits of CSR. Furthermore, an extensive list of related research regarding CSR performance and financial performance is depicted. An empirical study follows, comprising a sample of German firms to test whether higher ratings negatively influence equity beta and positively influence liquidity. Overall, four linear regressions and an ANOVA are performed.

The results showed a statistically significant negative correlation between CSR ratings and equity beta, even when controlling for firm size, liquidity, leverage and industry effects. However, when introducing the control variables, the regression coefficient becomes non-significant. Hence, CSR ratings seem not to have an influencing effect on equity beta. The same holds true for grouped CSR ratings. In addition, a possible relationship between CSR ratings and liquidity is tested. Similar to the findings regarding equity beta, the results suggest no influencing power of CSR ratings on stock liquidity.

#### **Appendix 4: Abstract (German)**

Während der letzten zwei Jahrzehnte haben sogenannte „Sustainable and Responsible Investment“ Finanzprodukte ein bemerkenswertes Wachstum erlebt. Zunehmend mehr Länder haben Gesetze erlassen, um Firmen zu verpflichten, auch nicht-finanzielle Leistungsindikatoren offenzulegen. Daher stellt sich die Frage, ob Kapitalmärkte soziale Verantwortung von Unternehmen („Corporate Social Responsibility“) belohnen. Diese Belohnung kann in Form von geringeren Kapitalkosten, insbesondere von Eigenkapitalkosten, erfolgen.

Diese Magisterarbeit soll einen Beitrag leisten zur Erforschung der Vor- und Nachteile von Corporate Social Responsibility (CSR), und eine mögliche Verbindung zwischen CSR und finanzieller Leistungsfähigkeit untersuchen. Zunächst gibt es einen Überblick über die externen Finanzierungsmöglichkeiten eines Unternehmens und dessen Kapitalkosten. Es folgt die Definition von CSR, einschließlich einer Diskussion über die Verantwortung eines Unternehmens gegenüber seinen Kapitaleignern („Shareholders“) und Interessensgruppen („Stakeholders“), sowie einer Gegenüberstellung von Kosten und Nutzen. Des Weiteren wird eine umfangreiche Sammlung von themenbezogenen Studien betreffend CSR und Finanzleistung vorgestellt. Es folgt die empirische Studie mit einer Stichprobe von deutschen Unternehmen, welche einen möglichen negativen oder positiven Einfluss von besseren CSR-Ratings auf „Equity-Beta“ bzw. Liquidität untersucht. Insgesamt sind vier lineare Regressionsanalysen und eine Varianzanalyse durchgeführt worden.

Die Ergebnisse der Studie zeigen eine statistisch signifikante und negative Korrelation zwischen CSR-Ratings und Equity-Beta, selbst wenn Firmengröße, Liquidität, Verschuldungsgrad sowie Industrieeffekte als Kontrollvariablen berücksichtigt werden. Da der Regressionskoeffizient allerdings nicht signifikant ist, wenn die Kontrollvariablen einbezogen werden, scheinen CSR-Ratings keine beeinflussende Wirkung auf Equity-Beta zu haben. Dasselbe Ergebnis zeigt sich für die gruppierten CSR-Ratings. Zusätzlich wird ein möglicher Zusammenhang zwischen CSR-Ratings und Liquidität untersucht. Ähnlich der Ergebnisse zu Equity-Beta, suggerieren die Resultate auch hier, dass CSR-Ratings keine Einflussgröße für die Liquidität von Aktien darstellen.

## Appendix 5: Curriculum Vitae

### PERSONAL DATA

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Name: Valentina METZ  
 Date of birth: January 15, 1986  
 Place of birth: Vienna, Austria  
 Citizenship: Austrian  
 Academic degree: Bachelor of Arts in Business Administration, Magistra rerum socialium oeconomiarumque

### EDUCATION

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2009-2012 University of Vienna, Austria  
 Master Programme in Corporate Finance and International Management  
 2008-2011 University of Vienna, Austria  
 Master Programme in External Accounting and Corporate Finance  
 Summer 2009 London School of Economics Summer School  
 Course: Analysis and Management of Financial Risk  
 2005-2008 University of Applied Sciences for Business and Engineering in Wiener Neustadt, Austria  
 Bachelor in International Accounting and Finance  
 Autumn 2006 Exchange semester at the University of Warwick  
 Warwick Business School, UK  
 2000-2005 Advanced-Level Secondary Vocational School, Biedermannsdorf  
 Focusing on media informatics, text processing and publishing, accounting and business economics  
 1996-2000 Grammar School, Mödling  
 1992-1996 Elementary School, Südstadt

### LANGUAGES

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German mother tongue  
 English business level – oral and written  
 Italian good – written, sufficient – oral

### CERTIFICATES

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ECDL European Computer Driving License  
 IELTS International English Language Testing System

### PUBLICATIONS

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Boss, M., Krenn, G., Metz, V., Puhr, C. und Schmitz, S. W.. *Systemically Important Accounts, Network Topology and Contagion in ARTIS*. Financial Stability Report 15, 93-111. Vienna: Oesterreichische Nationalbank, 2008.