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**ANALYSIS OF ENVIRONMENTAL AND SOCIAL SCORES ON FIRM
PROFITABILITY, LENDING AND DIVIDENDS IN GERMANY AND THE UK**

Master's Thesis in Finance

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ABSTRACT

This paper aims to investigate the effects of separate components of corporate social responsibility—social and environmental efforts in particular—on a firm’s operating profit margin, dividends per share and net debt. It also investigates whether such efforts can reduce firm exposure to market risk. One or a combination of these factors may consequently be responsible for lower expected returns on firms with greater ES ratings. For this purpose we study firms on the FTSE-100 and the HDAX from the period 2002-2014. Environmental and social scores for these firms are regressed against operating profit margin, dividends per share and net debt while controlling for relevant factors. The firms are then divided into groups based on their environmental and social rankings and we compare the covariance of their returns with market returns to gauge the relation of their sensitivity (beta) to ES scores. The results of the first part of the study indicate that ES scores are more strongly correlated with OPM, Div/Share and Net debt in HDAX than in FTSE-100. In addition there is a slight positive correlation between firm beta and ES scores, implying *increased* exposure to market risk.

KEYWORDS: Corporate Social Responsibility, Environmental scores, Social scores, Operating Profits Margin, Dividends per share, Net Debt, exposure to market risk

1 INTRODUCTION

The term Corporate Social Responsibility (CSR) has been in use since the 1960's to describe ethically responsible firm behavior according to a standard national or international norm. It has gained significant momentum in recent years and an increasing number of investors and consumers prefer firms with a history of good business practices and a clean environmental footprint. Environmental events such as the heat waves in South-East Asia in 2015 have resurfaced concerns about Global Warming and fossil fuel consumption. Moreover, investors and businessmen alike are motivated toward the preservation of national and firm-specific resources for greater long-term benefits. In addition, the growth of global supply chains has raised concerns about child labor, worker conditions and market manipulation in deregulated third country industries. Socially responsible investing has consequently given rise to investments funds concentrating on firms with high CSR scores and good business practices.

The decision to undertake better CSR practices is however not a unilateral one. While investor and consumer demand for CSR does exert external pressures on firms, it is offset by internal considerations, which include reduced operating profit margins, greater expenditures in investment and research and development, and diminishing returns from CSR practices over time. Management often has to weight these costs against the benefits of undertaking CSR for share price. It can be argued from this that the most expected candidates for CSR are large-cap firms because they can easily afford to accommodate additional costs to boost firm value and shareholder return.

For the purposes of this study, Corporate Social Responsibility is broken down into its three main categories: Environmental, Social and Governance practices (ESG). These are further explained in Section 2. There is sufficient recent literature on the effects of CSR as a whole on firm performance, and Albuquerque et al. find a negative correlation between high CSR scores and exposure to systematic risk and firm valuation. Moreover, in their paper 'What Matters in Corporate Governance', Bebchuk et al. find that an index of six governance factors, a subset of the Gompers, Ishi and Metrick governance index of 24 factors, is solely

responsible for reduction in firm value. Keeping these results in view, this paper will investigate the standalone effect of social and environmental responsibility based on firm ES rankings on operating profits, growth and exposure to systematic risk.

Forbes (2012) states that good CSR accounts for 40% of a company's reputation, and proposes that improved management of global supply chains, greater transparency and disclosure, and environmental sustainability consumption will be some of the most important CSR developments for firms in the coming decade. Undoubtedly these changes come at a cost to managers and CEOs, and the decision to implement improved CSR entails weighing the benefits of a good social image and possible long-term sustainability against those of immediate financial gain.

1.1 Purpose of the Study

The purpose of this paper is to determine the effects of Social and Environmental efforts separately on operating profit margins, dividends per share and net debt. Improvement in overall CSR has been shown to lead to reduced profitability, lower systematic risk and higher firm value, however, different firms have different degrees of involvement in each aspect of CSR. Environmental efforts such as sustainable consumption of resources may improve long-term profitability and growth, while social efforts such as improved management of global supply chains may result in lower immediate profits and slower growth.

H₀: Environmental and Social scores have no relation with firm operating profit margins, dividends per share or net debt.

H₁: Firms with high Environmental and Social scores have lower operating profit margins and dividends per share

H₂: Firms with high Environmental and Social scores have higher operating profit margins and dividends per share

H₃: Firms with high Environmental and Social scores have higher net debt

H₄: Firms with high Environmental and Social scores have lower net debt

1.2 Contribution of the Study

This paper contributes to existing literature on CSR and firm financials and valuation by refining the focus to a comparison of firms in two separate developed markets, and analyzing the separate influence of Environmental and Social CSR activities on the firms' balance sheets and exposure to market risk. The study of two economies highlights the necessity of studying the costs and benefits of CSR in conjunction with socio-economic and legislative context. Consequent results can be used to match a firm's CSR efforts with the conditions of its balance sheet, and construct more efficient Socially Responsible Investment (SRI) portfolios. It will also help to explain why some firms shy away from active involvement in particular relevant areas of CSR.

1.3 Structure of the Thesis

This thesis is structured as follows.

Chapter 2 presents the findings of previous literature that explores the significance of CSR participation on firm value and profitability, and analyzes the methods used and the results achieved. Of particular importance is the consistent presence of 'demand' and 'supply' of CSR activities since the 1950's, the growing trends in this demand and supply over the recent decades, and the costs and benefits incurred by firms for engaging in CSR practices. Apart from the apparent investment and training costs that come with adopting CSR practices, firms may witness a number of indirect costs, including but not limited to the decreasing marginal benefits of CSR to firm value and reduction in return to shareholders.

Chapter 3 details the theoretical background of the models that first introduced and applied the variable Beta and its significance as an indicator of systematic risk. Later on, monthly return data on firms in the FTSE-100 and HDAX is used to calculate their beta for the given

period (2002-2014), and these betas are then plotted against environmental and social scores. These trendlines are presented in the section on descriptive statistics.

Chapter 4 presents a comparison of the economies of Germany and the UK, detailing the similarities and differences, and highlighting the significance of the choice of markets used in this study. This further serves as a backdrop to the present research and allows an understanding of the two countries that would be necessary for interpreting the results of the empirical analysis.

Chapter 5 establishes the definition of Corporate Social Responsibility used in this study, the historical evolution of the significance of CSR in developed economies, and the components of CSR as defined by the Thompson Reuters ESG matrix. Chapter 6, 7 and 8 describe the research methodology, i.e., the models used to conduct the empirical analysis, the descriptive statistics of key variables for both markets, and results of the empirical analysis respectively.

Lastly, the conclusion draws together the findings of the empirical analysis and the final section on further research proposes areas of interest that are open to more thorough scientific testing.

2 LITERATURE REVIEW

The merits of Corporate Social Responsibility have been studied for almost 50 years, but the majority of the literature is concentrated in the previous decade. With growing trends in socially responsible investing, researchers in finance and economics try to determine if CSR practices add value to the firm, and where that value can be realized.

Early studies on corporate social responsibility provide invaluable insight into business and investment attitudes towards CSR. However, it would be problematic to suggest that results of these studies could just as easily be applied in present-day research. For one, CSR has evolved over the past three decades from a supplementary gold star and a ‘gesture’ of good will to a necessity that is to a great extent imposed lawfully on companies in recent years. In addition, investor and consumer awareness of CSR initiatives has led to an increasing demand on corporations to compete not just on price margins and quality of their services but the extent to which they can give back to society and prevent damage to the environment through operations.

One of the precedents in the study of CSR and firm performance, Heinkel et al. (2001) make a surprising discovery in their paper ‘The Effect of Green Investment on Corporate Behavior’. By drawing up a model for exclusionary investment in a risk-averse, equilibrium setting, they study the effect of ‘green’ investment on the returns for polluting firms. Their findings suggest that even if 10% of the polluting firms’ ownership practice exclusionary investment, these ‘green’ investors can significantly reduce returns and increase the cost of capital for the remaining investors. While Heinkel et al. do not study the costs of implementing CSR, they show that the costs of overlooking it while consumers and investors demand it can indeed be significant.

While according to Heinkel et al. (2001), polluting firms continue to pay the price in terms of increased cost of capital and lost return, Laguna and Capelle-Blancard (2010) study more drastic environmental events in recent years, and how they affect share price. In their research

they gather a sample of 64 events consisting of explosions in chemical plants and refineries around the world over a 15-year period (1990-2005). They find that environmental disaster events correspond to a 1.3% drop in market value of the firm within 2 days following the disaster, and that the loss in market capitalization is approximately 12% in the following 6 months.

Laguna and Capelle-Balncard (2010) make an interesting note when analyzing the financial effects of the 64 chemical disasters. They are able to approximately quantify the extent of loss to the firm in millions of dollars for contingencies such as the loss of life or injury, and extensive damage to the environment. They note that among the disasters studies, the case of the BP oil spill stands out because it suffered significantly higher losses on the stock market. Moreover, the losses did not appear consistent with the actual oil spill itself, but in fact magnified when President Barack Obama declared the spill a 'national emergency' and claimed that the firm would be held responsible for all cleanup costs. On the subsequent comparison between post-disaster costs and preventive costs, the authors remain ambiguous.

The above example raises a question that is both ethically and empirically important to any firm-level discussion on the implementation of CSR: can the value added through environmental responsibility be measured through the costs (preventive or consequential) of adopting it? For instance, if BP's environmental accident was priced by the stock markets based on the cleanup costs it had to pay (which reduced shareholder return), then could preventive environmental responsibility be similarly priced through the costs it exerted on the firm's balance sheet? And if so, then where does the balance of payments lie? Looking back at Heinkel et al.'s study (2010), it would appear that the behavior of exclusionary 'green' investors does not exert as much of an influence on stock returns as the severe contention over cleanup costs.

A more detailed analysis of the preventive costs of environmental disasters and the daily opportunity costs of bad CSR through exclusionary investment will shed more light on the

above conundrum, and such an analysis is beyond the scope of this paper. For now, we return to the discussion on the costs and benefits of CSR as shown through prior literature.

While Heinkel et al.'s study (2001) theoretically attested to the exclusionary power of 'green' investors on the condition that such investors were present and accounted for 10% of a firm's ownership, Flammer's event study based on the announcement of corporate news for environmental activity over a period of 29 years (1980-2009) concludes that 'green' investment or 'environmental awareness' among investors is not only present and active in the stock market but indeed plays a significant role as proposed by Heinkel et al. In her paper 'Corporate Social Responsibility and Stock Prices: The Environmental Awareness of Shareholders' (2012), Flammer shows that stock market response to environmental news is present and bilateral, i.e., not only are firms significantly positively affected by news of good environmental practices, but are also significantly negatively affected by news of bad environmental practices. This bilateral effect is explained by Flammer through her theory of external and internal moderators, wherein demand from consumers and investors is regarded as an 'external' moderator that exacerbates the negative effects of 'bad' CSR and the diminishing marginal returns of environmental activism is an 'internal' moderator, which leads to smaller positive returns for companies with a history of 'good' environmental CSR.

Flammer's research once again emphasizes that environmental 'news' has significant influence on stock prices, yet it would appear that the rewards for 'good' CSR get smaller and smaller once the initial 'goodwill' is absorbed in firm value. This further raises the question that whether all firms can afford to be in the competition for good CSR. Big firms that can absorb the costs of maintaining CSR are at a distinct advantage over smaller, newer firms that cannot readily shoulder the costs of a long-term commitment to CSR. On the other hand, new entrants can compete against each other for capturing the greater returns associated with CSR implementation. This is highly dependent upon industry and geography. Costs of implementing CSR vary depending upon the costs of initial investment, profit margins, and the legal requirements and subsidies provided. For instance, car manufacturers require large initial investments for research and manufacture of low-emission engines. Meanwhile, fast

food restaurants have to face daily costs of using organic, free-range ingredients which can further reduce their competitive profit margins. A similar case can be made for the difference in CSR costs in developed and developing economies, considering that investors and consumers of developing countries do not demonstrate a matching demand or exclusivity for good CSR firms.

Similar to the findings by Moura-Leite & Padgett (2011), Flammer also shows that the negative response to bad CSR has significantly increased over time while positive response to good CSR has significantly decreased. This again signifies the incorporation of CSR fundamentals in the legal framework of developed nations, and the fact that CSR is

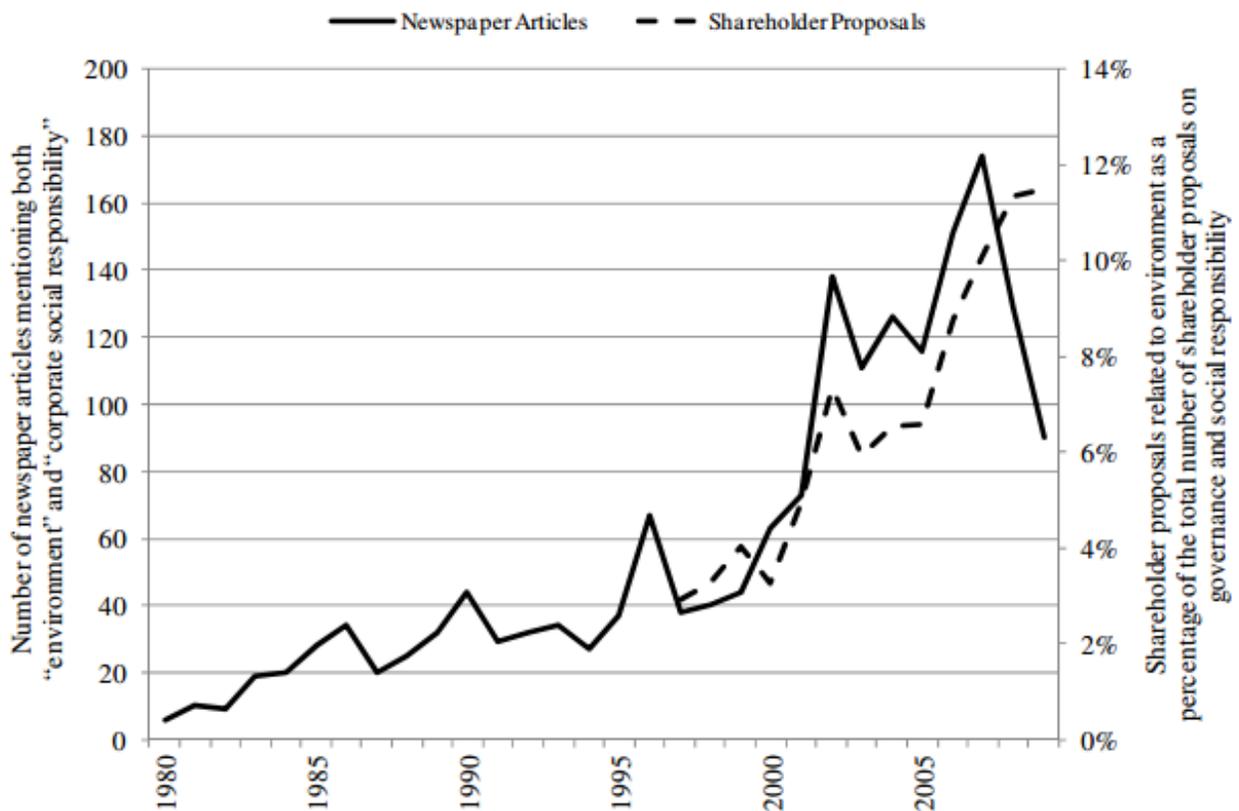


Figure 1. ‘Evolution of Media Attention and Shareholder proposals Related to Environmental CSR’ (Caroline Flammer 2012)

increasingly becoming an expected quality for firms operating in developed economies. Can this change and its economic effects be transposed on developing markets? In their paper ‘Convergence vs. Divergence of CSR in Developing Countries’ (2011), Jamali and Neville attempt to uncover patterns of convergence or divergence in Lebanon through compiled multi-layered institutional framework of MNCs. They discover a ‘cosmetic’ layer of global CSR convergence with underlying divergences. Their findings suggest that the inherent differences in global CSR arise from the fact that it is impractical to ‘import’ CSR into developing economies. This suggests that institutional and lawful enforcement and investor awareness are distinct motives for CSR, and that the latter might well precede the former in terms of influence and the incorporation of CSR in developed markets.

Windsor in his paper ‘The Future of Corporate Social Responsibility’, 2001, argues that sometimes the behavior of investors is not driven by profit-hunting but by their preference for CSR. If the effects of CSR on stock returns were relevant in 2001, they are certainly significant for firm performance and corporate decision making in 2016, with research from KPMG’s 2011 International Corporate Responsibility Report stating that there was a 9% increase in the number of companies reporting their CSR initiatives from 2008-2011 in the US, an 8% increase in the UK, and a 17% increase in Canada.

While investor decisions to opt for SRIs may be largely driven by behavioral finance, management decisions to undertake CSR initiatives cannot be made without considerations for their pursuit of profitability and return. In their paper ‘Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies’, 2007, Mackey et al. propose a theoretical model for the impact of CSR activities on the firm’s market value, as determined by the supply and demand of these activities. They use the Efficient Market Hypothesis assumptions and discover that in equilibrium, share prices do not differ for socially responsible firms, but note that in real market conditions, there exist a different balance of supply and demand for CSR that would motivate managers to be more socially responsible. They conclude that value created through such activities is therefore dependent

on the supply and demand for CSR in the present time, and that consequently, increase in CSR will be positively correlated with value (Mackey et al. 2007).

Mackey et al.'s study builds upon the famous research by McWilliams and Siegel in 2001, who were the first to suggest a supply and demand model for CSR. Subsequent papers similarly detail a 'good balance' of CSR, one that optimizes compromises in profitability and increase in firm value. Evidently, the decision to undertake CSR initiatives is often a tradeoff between higher present profits, and long-term sustainability and goodwill. As exposed by Bebchuck et al. in 2009, an increase in a firm's corporate governance score would result in reduced value and returns because the costs of implementing governance reduce profits that could have been internalized or returned to the shareholders. Similarly, Mackey et al. also acknowledge that pursuing CSR activities can often translate into lower returns to equity holders due to the transference of value to other stakeholders of the firm.

Meanwhile, empirical evidence from studies on the effects of CSR activity on firm valuation is not definitive. Crisostomo et al. (2005) find a negative relation between CSR and firm value in Brazil, while Servaes & Tamayo (2013) discover that firm value is positively related to high CSR but only for firms with high customer awareness. Jo & Harjoto (2011) find that the impact of CSR on firm value depends on the dominant subcategories of CSR employed.

These conflicting results indicate that different components of CSR have diverse effects on the determinants on firm value. Their effects should therefore be studied on factors implied by different asset pricing models, such as free cash flows and risk. Investigating such variables independently proves to be more rewarding, as demonstrated by Ghoul et al. in 2011 while studying effects of CSR on cost of equity capital. Ghoul et al. find that *ceteris paribus*, high CSR firms have lower equity costs of capital. Similar to the approach used in this paper, they use multiple dimensions of CSR while controlling for governance characteristics. They employ four different models to estimate the cost of equity similar to Hail and Leuz (2006) and Dhaliwal et al. (2006), and rely on KLD STATS for CSR estimate scores (Ghoul et al. 2011). They conduct a univariate analysis with mean and median cost of

equity for firms with high and low CSR, and then a multivariate regression controlling for beta, size and other factors relevant to cost of equity. The most interesting aspect of their study is their finding that employee relations, environmental performance and product characteristics are the only components of CSR with a significant impact on cost of equity. These specifics perhaps account for their explanation that low CSR firms would have reduced investor base and higher perceived risk (Ghoul et al. 2011).

Ghoul et al.'s findings are particularly relevant for exclusivity in the selection of CSR initiatives for managers and executives. The adoption of CSR has evolved into a sophisticated analysis of its breakdown into firm and industry-specific responsibilities and the magnitude and direction of their impact on performance and value drivers. In this regard, the literature on CSR is still deficient and there is substantial potential for subsequent research to be conducted.

One of the more recent papers does in fact study the effects of CSR on firm beta after excluding governance measures. Albuquerque et al. (2013) use MSCI's ESG index on US firms from the year 2003-2011. They aggregate the six categories of the index to create new ES scores, and use Fama and French (1992) three factor model to estimate firm betas (Albuquerque et al. 2013). They find that higher ES scores correspond to lower exposure to systematic risk (firm betas).

The primary difference in this paper and the study done by Albuquerque et al. is that instead of aggregating the sum of Social and Environmental scores, we compare their effects separately in an attempt to gauge which category contributes the greatest reduction in firm beta. We also follow Novy-Marx's (2013) model including operating profits as a factor in return estimation to calculate firm betas. Additionally, our analysis of CSR impact on profitability focuses on the firms' operating profits because of tax reduction implications for firms with high CSR scores and in line with Ball et al. (2014), since operating profits better match current revenue and costs.

3 THEORETICAL BACKGROUND

The following chapter reviews the theoretical concepts in finance that are instrumental to the study of investor and firm preferences for corporate social responsibility and how these preferences translate into profitability and exposure to market risk.

3.1 *Beta*

The beta of a firm's stock measures its volatility or systematic risk against market volatility. Since the beta of a market portfolio is denoted as '1', the beta of a firm's stock is weighed against that of a market portfolio. For instance, a stock with a beta of 0.6 is 0.6 *times* as volatile as the market portfolio, whereas a stock with a beta of 2.3 is 2.3 *times* as volatile. Higher betas represent greater exposure to systematic risk – subsequently higher returns when the market does well and greater losses when the market goes down.

First used by William Sharpe (1964) and John Lintner (1965), beta was introduced as part of Sharpe and Lintner's Capital Asset Pricing Model. Subsequently, it has been employed in various other models including the Fama and French 3 Factor model (1992), the Arbitrage Pricing Theory (1976) and the Novy Marx Profitability premium model (2012). It is fundamental to asset pricing and returns.

A security's beta is estimated by regressing its returns against market returns using the following equation:

$$r_{a,t} = \alpha + \beta r_{b,t} + \varepsilon_t$$

Where $r_{a,t}$ = return on asset a at time t,

α = security alpha (percentage return above market return),

and $r_{b,t}$ = return of benchmark at time t

Beta can also be expressed as:

$$\beta = \frac{\text{Cov}(r_a, r_b)}{\text{Var}(r_b)}$$

The relationship between beta and expected return is represented by the security market line. According to the Capital Asset Pricing theory, all portfolios must lie on the security market line (Brealey et al. 2011). In reality, portfolios with low betas have been shown to lie above the SML and those with high betas to lie below the SML. This has cast doubt over the validity of CAPM as a suitable pricing model in recent times, and various theories are suggested to explain the inconsistency.

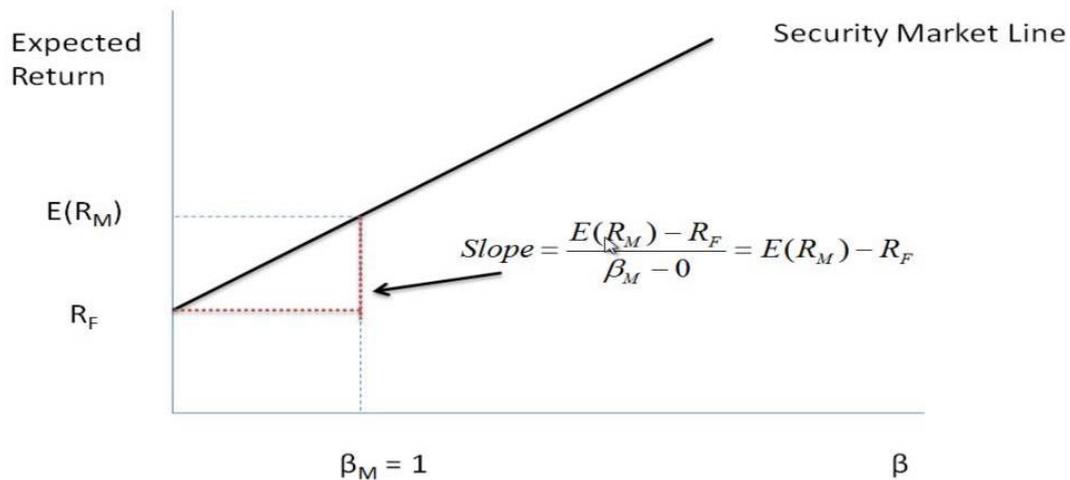


Figure 2. The Security Market Line

3.1.1 The Capital Asset Pricing Model

The Capital Asset Pricing Model first proposed by Sharpe (1964) and Lintner (1965) proposes that expected excess asset returns are a linear function of expected excess market returns. The model is represented as:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

Where, $E(R_i)$ = Expected returns on asset i

R_f = Risk free rate of return

$E(R_m)$ = Expected returns on market portfolio

and β_i = coefficient of excess expected market returns

(Sharpe & Lintner, 1964, 1965)

CAPM has been used extensively in asset pricing and return estimation over the decades, but its adequacy has been questioned repeatedly when tested under real market conditions. The assumptions under which the CAPM is proposed to work include homogeneity of expectations, no taxes or transaction costs, complete information symmetry, and the ability of investors to borrow at the risk free rate of return. Perhaps for these reasons when the CAPM is tested using real data, it falls short of suitable approximation. In reality, investors have to face taxes *and* transaction costs, they are usually unable to borrow at as low as the risk free rate of return and behavioral finance theorists insist that investor expectations are far from homogenous.

Several anomalies have since been studied that further poke holes at the CAPM, the most significant of which include the small firm effect, the Price/Earnings ratio effect and the Book to Market ratio effect. As a consequence, different models have been proposed to account for the most significant of these anomalies, and thus both the size factor and the B/M ratio were included in the Fama and French 3 Factor Model.

3.1.2 Fama and French 3 factor Model

This model proposed by Eugene Fama and Kenneth French in 1992 attempts to improve on the Capital Asset Pricing Model by introducing two new factors to the equation for estimating expected asset returns:

$$r = R_f + \beta_3(K_m - R_f) + b_s \cdot SMB + b_v \cdot HML + \alpha$$

Where SMB (small minus big) = excess returns of small cap over big cap

And HML (high minus low) = excess returns of high B/M ratio over low B/M ratio (Brealey et al. 2011).

The Fama and French 3 Factor model is shown to explain 90% of diversified portfolio returns, an improvement over CAPM's 70%. While the β in the Fama and French 3 factor model is analogous to CAPM's β , the two are not equal in value. This is because in the Fama and French 3 factor model, β was found to be negatively correlated with size. A large portion of β 's predictive power in the latter model is thus absorbed by the size factor.

In 2015, Fama and French proceeded to propose a five factor model, one which included profitability and investment factors. Both factors are ‘quality’ factors, and have shown significant predictive power over asset returns, yet scholars are divided in their opinion on the necessity of the addition.

3.1.3 Novy Marx’s Profitability Model

While discussing the addition of the profitability factor to the recent literature of predicting asset returns, it is worth mentioning the contribution of Robert Novy-Marx (2012) in bringing to light the power of operating profitability in explaining a range of earning-related anomalies. He concludes that since a strategy based on firm profitability is essentially a growth strategy, profitability couples well with existing value investments without increasing overall risk of the portfolio (Novy-Marx 2012).

The newfound potential within operating profitability as a predictor of sorts makes it an interesting variable in this study. By examining the relationship between operating profit margin and environmental and social scores, we can improve our understanding of the effect of these scores on stock price. For instance, if tests reveal a negative relation between social/environmental scores and operating profit margin as proposed by H₁, it would imply that a firm’s environmental and social initiatives hold greater weight with investors than is suggested merely by share price.

4 COMPARISON OF ECONOMIES – GERMANY AND THE UK

In this chapter, a comparison of relevant economic indicators and stock market statistics is conducted for Germany and UK. Since this study focuses on the correlation between financial indicators and CSR activities in Germany and UK, it is important not only to understand the similarities but also the differences between the two markets. This information will be of further importance in interpreting the results of the empirical analysis.

German and UK stock markets were selected for this study because in addition to being developed economies, they are also the largest economies in Europe. Selecting developed markets was of significance to this study to ensure that there is sufficient demand and supply of CSR activities. Subsequently, CSR scores will have a greater impact on stock and firm performance in developed rather than developing nations. Moreover, selecting the largest economies in Europe allowed the study to focus on a landscape more populated with quality stocks and large, blue-chip firms. These firms tend to have greater capital and incentive for CSR investment.

Germany is also one of the biggest export destinations and the biggest import origin for UK. In 2014 alone, the exports from Germany to UK exceeded \$46 billion, and the imports were approximately \$100 billion. UK imports in Germany were under \$50 billion, yet it still stood as the fifth largest importer to Germany. It is evident that the economies are mutually dependent to an extent, however, Germany has been in a trade surplus for over a decade, while the UK has been suffering a trade deficit for nearly as long (OEC 2015).

Another reason for selecting Germany and the UK is because of their similar demographics. UK and Germany have similar literacy rates, employment rates, age structure, population

growth, health and education expenditures, GDP per capita and composition of GDP by sector (Indexmundi 2014).

Because the values for the above socio-economic variables are so similar for both the UK and Germany, it can be assumed that any differences arising in the impact of CSR activities on firms' balance sheets or vice versa between the countries is not attributable to the population statistics of either country. Greater expected CSR investment for firms in Germany for instance is not attributable to a higher literacy rate or age demographics, because Germany and UK share approximately the same values for these variables.

4.1 Debt to Equity Ratios

One of the more significant differences in the operation of corporate finance in the two countries is the average debt-to-equity ratios. The debt-to-equity ratio signifies the amount of capital acquired through borrowing versus the amount of capital acquired through selling shares. Countries with fewer borrowing restrictions and greater variety of borrowing options tend to have firms with higher debt-to-equity ratios. However, very high debt-to-equity ratios often spell trouble for firms, especially when the economy declines or the interest rates fall.

The following charts depict the difference in average debt-to-equity ratios in the financial sector (figure 4.1.1) and the difference in average debt-to-surplus ratio in the non-financial sector (figure 4.1.2) for Germany and the UK. The debt-to-surplus ratio is defined as the ratio of a firm's net outstanding liabilities to the annual flow of gross operating surplus.

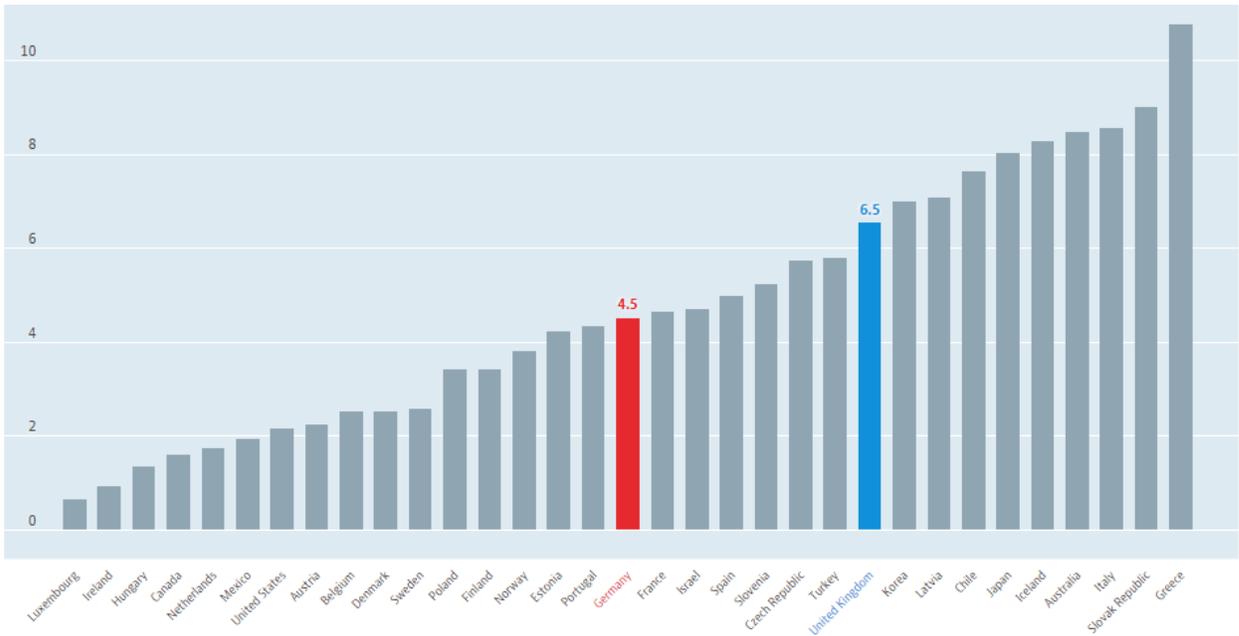


Figure 3. Debt to equity ratios for financial sector by country (2014)

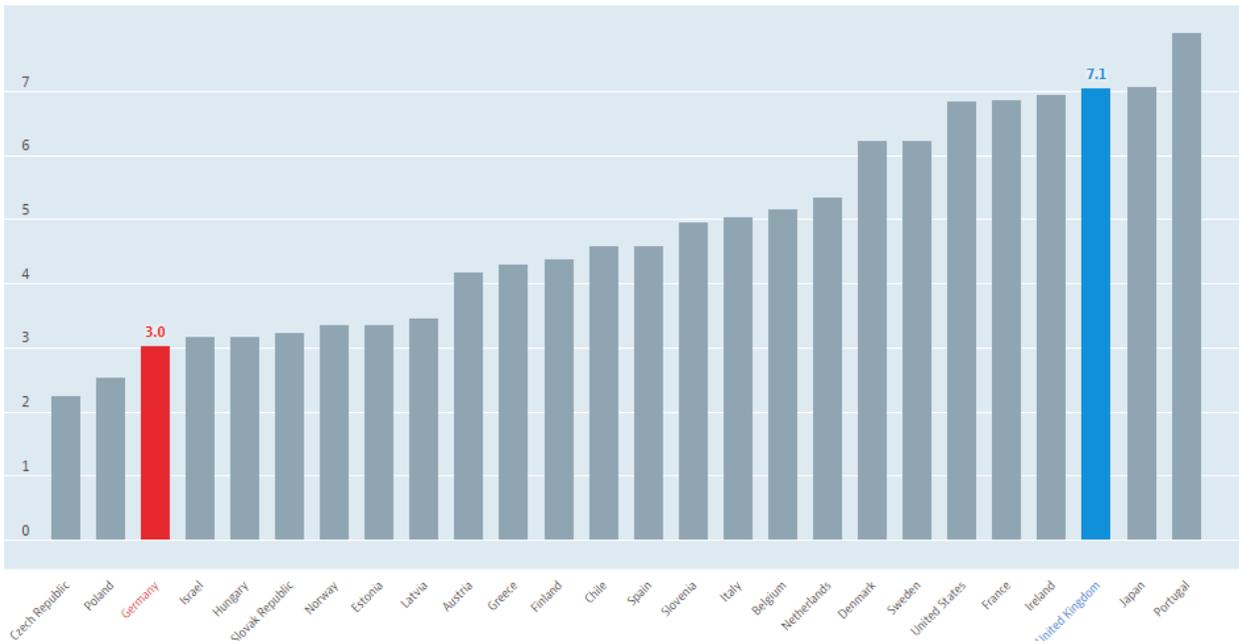


Figure 4. Debt to surplus ratios for the non-financial sector by country (2014)

Debt financing is clearly more heavily used in the UK as opposed to in Germany. Moreover, the gap is widened when looking at firms in the non-financial sector in both economies. The reduced use of leverage as a source of capital in the non-financial sector, coupled with the higher demand for both environmental and social initiatives from this sector, implies that CSR investment would have no significant impact on a firm's total borrowing in Germany. The opposite may be implied for firms in the UK.

4.2 Legislature regarding CSR

Germany and the UK, despite being two of the most competitive economies of Europe, have a different set of legislation for the structure and implementation of CSR initiatives for businesses. While the UK was, until recently (June 23, 2016), a part of the European Union, it does not follow the CSR guidelines and legislation adopted by the European Commission. Instead, the UK Corporate Governance Code, the Company Act (2006), and subsequent standalone amendments to the corporate legislation are meant to serve as guidelines for companies and to encourage them to adopt best business practices.

The UK Corporate Governance code is based on the principles that a company's duties and obligations extend beyond serving the shareholder interests. It therefore aims to promote the 'good governance' aspect of CSR. Meanwhile, the Company Act (2006) and the Climate Change Act (2008) also take into account a company's impact on its environment. Further legislation and subsequent amendments resulted in a number of acts for the promotion and sustainability of a company's social responsibility, including the Working Time (Amendment) Regulation 2001, Race Relations Act (Statutory Duties) Order 2001, Disability Discrimination Act 1995, Maternity and Paternal Leave (Amendment) Regulations 2001, Employment Act 2002, and the Health and Safety at Work Act 1974.

While these legislations cover the necessities of good corporate behavior to safeguard the rights of stakeholders and employees, they don't go beyond recommending further corporate participation in CSR to improve business practices. The Confederation of British Industry (CBI) maintains that ultimately, CSR should remain voluntary and market-driven (Kinderman 2012).

On the other hand, Germany follows the European Commission's strategy on CSR, which involves a broader approach to better assimilate CSR knowledge and practices into the European community. It ranges from integrating CSR into education, training and research, providing self and co-regulating process for CSR and increasing market rewards for practicing CSR to increasing visibility, disclosure and levels of trust in businesses. Similar to CBI's stand, the European Commission also deems CSR as ultimately a voluntary practice.

5 CORPORATE SOCIAL RESPONSIBILITY

5.1 Definition

Corporate Social Responsibility has been attributed a variety of dissimilar meanings by scholars of different communities, highlighting that it is subject to social understanding and interpretation (Dahlsrud 2006). For instance, it was defined by Frederick et al. (1992) as a principle stating that corporations should be accountable for the effects of their actions on society and the environment, and by the Commission of European Communities (2001) as

‘a concept, whereby companies integrate social and environmental concerns in their business operations and in their interaction with stakeholders on a voluntary basis’.

This paper will lean toward the latter definition, as it emphasizes that the actions and reactions of corporations for the benefit of the community and environment are voluntary. The components of CSR can also vary to some extent. However, ‘society’ and ‘environment’ are always recurring associations of CSR, and Economic and Stakeholder dimensions are often included (Dahlsrud 2006). As discussed earlier in the section on literature review, recent studies show that the effects of good and bad CSR are significant yet asymmetrical. While returns are largely reduced by an oversight in CSR, they do not improve by the same amount when information about good CSR practice is released. Excluding legally required components and keeping only activities that fall under ‘voluntary’ bounds of company action should help reduce this mismatch.

5.2 Corporate Social Responsibility in recent times

What makes Corporate Social Responsibility relevant and interesting is that amid growing discontent over inequality in a capitalist society in the US and in the aftermath of lobbying scandals, an increasing extent of investor confidence and optimism can be attributed to a

firm's involvement in CSR (Forbes 2012). Moreover, with several corporations going global over the last decade and outsourcing their production and assembly supply chain, consumers are increasingly conscious of the effects of firm activity on global communities. These concerns could translate into higher value for CSR firms.

In fact, several industries are already facing fierce competition in upholding and improving their CSR. Businesses with few growth opportunities remaining turn to CSR as an avenue for market capitalization. This is evident from the recent bid by fast food giants in North America to switch to cage-free eggs by as early as the end of 2016 (Forbes 2016). Despite constrictive profit margins in the fast food industry, McDonalds, Dunkin Donuts and Taco Bell have all voiced their commitment to switching to the pricier, eco-friendly alternative, and while 47% of consumers welcome the change, only 17% of those are willing to pay more for it. The response of profitability to CSR is tricky to gauge. While the restaurants may benefit from a 17% increase in revenues after the switch, is it likely to cover the costs of the move, and will they lose sales to more economic options?

These problems suggest that CSR must be separated layer by layer because each category of components is likely to have a distinct relation with external and internal response.

The Commission for European Communities in its Green Paper (2001) segments CSR into an internal and external dimension. The Thompson Reuters ESG matrix is used in this paper. According to this matrix, subcategories of CSR may be separated by the following distinctions:

Environmental Concerns

1. Management of Environmental impact of outputs (emission & waste)
2. Management of natural resources (inputs such as energy, water)

Social Concerns

1. Local Communities

2. Human Rights
3. Product Safety, Responsible Marketing
4. Impact on development in third countries

Governance Concerns:

1. Human resource Management
2. Health and Safety at Work
3. Adaption to change
4. Full Disclosure and Transparency

5.3 History of Corporate Social Responsibility

Concern for corporate social responsibility has been gaining strength since the early 1950's and since that period has ballooned from concepts of employee management and philanthropy into direct strategic and performance implications for firms and investors (Carrol 2008). Over the decades, corporate social responsibility has helped bridge the gap between stakeholders and firm management (Moura-Leite & Padgett 2011).

One of the earliest publications on the importance of corporate social responsibility is Howard R. Bowen's *Social Responsibilities of the Businessman* (1953). Howard R. Bowen, along with author Morrell Heald both cite examples of institutional changes following the incorporation of corporate social responsibility since the beginning of the twentieth century (Moura-Leite & Padgett 2011). These writers provide evidence that CSR has long since been intriguing not only due to its impact on society but also due to its impact on corporate governance. In spite of this initial interest, Carroll and Shabana (2010) note that studies of the impact of CSR on benefits to firm and shareholders did not emerge until later in the century.

Similar early literature on CSR focuses on normative principles and the definition of boundaries for ‘necessary’ corporate social responsibility. Early CSR mainly involved philanthropy on the part of corporations and also struggled to incorporate a common ground for evolving labor union demands.

Two significant contributions to the literature on CSR were made by Joseph McGuire and Milton Friedman. McGuire argued in his book in 1963 that corporations had a responsibility to society that extended beyond their fundamental ‘economic and legal obligations’ (Moura-Leite & Padgett 2011). Friedman (1962) emphasized that CSR could not undermine the focus of a corporation toward profit maximization because such CSR would then be detrimental to its shareholders. Friedman’s argument suggests that CSR should not go as far as outright philanthropy; even while social responsibility and good governance are two separate distinct areas of CSR, a firm’s efforts at benefiting society should not cost its shareholders to the extent that the net result is a negative impact on firm CSR. The implications of these arguments present a further area of interesting research – how separate efforts can be evaluated while ranking firms, given the multifaceted nature of their effects.

A similar understanding went into the development of the ‘enlightened self-interest model’ in 1970’s. In the following decade, corporations were brought even closer to their stakeholders while the notion of philanthropy evolved into one of ‘public liability’ (Moura-Leite & Padgett 2011). Therefore, actions that were once construed as the ‘good will’ of corporations were now increasingly being viewed as a social accountability. From this it might be inferred that prior to the 1980’s, the decision to engage in CSR would have a greater positive impact on a company’s reputation and in contrast, after the 1990’s, lack of CSR would have a greater negative impact.

Because the relationship between a business and society has always been implicit, a significant proportion of literature from the 1970’s and 80’s seeks to explore and define this relationship in order to establish what fell under the definition of public liability for a firm, and whether CSR initiatives were complimentary or contrary to a firm’s business practices.

Both Peter Drucker (1984) and Cochran and Wood (1984) find that higher CSR improves a firm's financial performance (Moura-Leite & Padgett 2011).

In conclusion, while corporate social responsibility was initially much more voluntary, modern laws and regulations regarding corporate governance and employee provisions, evidence of positive correlation between CSR and firm performance, and a large investor base following of a firm's social and environmental reputation have resulted in majority of firms on world-wide stock indices to be awarded annual rankings, and these rankings are consistently negatively skewed. This can be seen in the section on Descriptive Statistics.

6 DATA AND METHODOLOGY

This chapter presents the data and the research methods used to conduct empirical tests. First it explains the sources and selection of data and then moves on to the empirical equations and the choice of control variables.

6.1 Data Selection

For the purposes of this study, separate Environmental, Social and Governance rankings, along with financial performance and stock returns are collected for firms on Stock market indices in the UK and Germany. The sample therefore includes FTSE 100 and HDAX firms from the period 2002-2014. Developed markets are chosen for this paper because it is presumed that investor following on CSR trends is greater in these markets. In addition, the evaluation of the effects of CSR in two separate markets also allows a comparison between the geographical influences on the effects of Environmental and Social scores between these markets.

Data is gathered from Thompson Financial and Worldscope databases. The Thompson Reuters ESG database awards each company one point for compliance in each of its 278 governance, 516 social and 322 environmental subcategories. These subcategories can be summarized by the main concerns listed in Table 1.

The data is first screened for missing values. Firms with more than 4 years of missing financial data or missing ES&G ratings are not included in this empirical study. This leaves us with 93 firms from FTSE-100 and 91 firms from HDAX. Variables for these firms regressed over a period of 13 years provides a sample with approximately 2000 observations.

6.2 Empirical models

This paper studies two separate relationships, and likewise, two types of empirical tests are employed to obtain the results. For the first hypothesis, a multivariate time-series regression model is applied between Operating Profits Margin and Social and Environmental scores. The following equation is used to estimate the relationship:

$$(1) \quad \text{OPMargin}_{it} = \beta_0 + \beta_1 \ln \text{Asset}_{it} + \beta_2 \text{Earnings_Share}_{it} + \beta_3 \text{ASSETTURN}_{it} + \beta_4 \text{Interest_Cover} + \beta_5 \text{MTBV}_{it} + \beta_6 \text{Payout_Ratio}_{it} + \beta_7 \text{GOV}_{it} + \beta_8 \text{ENV}_{it} + \beta_9 \text{SOC} + \varepsilon_{it}$$

The control variables included in this equation are the size of the firm (ln Assets), earnings per share (Earnings_Share), asset turnover ratio (ASSETTURN), interest coverage ratio (Interest_Cover), market to book value ratio (MTBV), the payout ratio (Payout_Ratio) and the score for Corporate Governance (GOV). Fixed effects cross section panel data regression method with period weights is used to estimate this equation.

The second part of the hypothesis relates Environmental and Social scores to dividends per share.

$$(2) \quad \text{Div_Share}_{it} = \beta_0 + \beta_1 \ln \text{Asset}_{it} + \beta_2 \text{Earnings_Share}_{it} + \beta_3 \text{Sales_Share} + \beta_4 \text{MTBV}_{it} + \beta_5 \text{Payout_Ratio}_{it} + \beta_6 \text{GOV}_{it} + \beta_7 \text{ENV}_{it} + \beta_8 \text{SOC} + \varepsilon_{it}$$

$$(3) \quad \ln(\text{Net Debt})_{it} = \beta_0 + \beta_1 \ln \text{Asset}_{it} + \beta_2 \text{Interest_Cover}_{it} + \beta_3 \ln \text{Operating_Income}_{it} + \beta_4 \text{Payout_Ratio}_{it} + \beta_5 \text{GOV}_{it} + \beta_6 \text{ENV}_{it} + \beta_7 \text{SOC} + \varepsilon_{it}$$

6.3 Limitations of the Study

One of the primary limitations of this study is the current adverse selection present in analyst and ESG rankings data. For some firms in the sample, ESG rankings are missing for earlier years with poorer firm performance. Such firms have been excluded from the analysis. Stocks that are listed on FTSE and HDAX are more susceptible to this adverse selection, and it can be inferred that similar if not more severe omissions are present in developing markets which would make studies of firm performance and ESG rankings more challenging.

In addition, this study only focuses on incorporated firms with stocks selling on the FTSE-100 and HDAX. In reality, many firms whose main focus is CSR tend to be smaller, private firms, known in the US as Benefit corporations, or B corps. Since a majority of B corporations are not publicly traded, there is no reliable source of financial data for these firms, and an analysis of their financial performance alongside those of large, publicly traded for-profit corporations could not be conducted.

7 DESCRIPTIVE STATISTICS

This section details descriptive statistics for the data collected on Environmental and Social scores, and how these scores appear to relate to firm beta.

7.1 Summary Statistics of Key Variables

The following tables list the descriptive statistics for firms in FTSE-100 and HDAX respectively. Each table lists the mean, median, minimum, maximum, standard deviation, skewness and kurtosis for key variables in our analysis.

	Social Scores	Environmental Scores	Operating Profit Margins	Div/Share	Ln (Net Debt)
Mean	79.3280	76.2183	17.3069	0.3067	16.2735
Median	85.8800	84.9600	15.0700	0.1790	13.7051
Maximum	98.8300	97.3100	71.0600	13.217	20.2255
Minimum	6.2000	14.7200	-15.3300	0	0
Std. Dev.	18.1178	21.2094	11.8942	0.5756	17.7553
Skewness	-1.4196	-1.2942	1.0483	12.6061	1.9306
Kurtosis	4.4646	3.6631	4.3079	243.0909	4.0012
Observations	1209	1209	1209		1209

Table 1. Descriptive Statistics for firms in FTSE-100 (2002-2014)

According to the table above, firms in FTSE-100 have environmental and social rankings that are positively skewed, and from 2002-2014, have overall positive operating margins. The following graphs depict the trends in average environmental and social ratings of firms over 2002-2014.

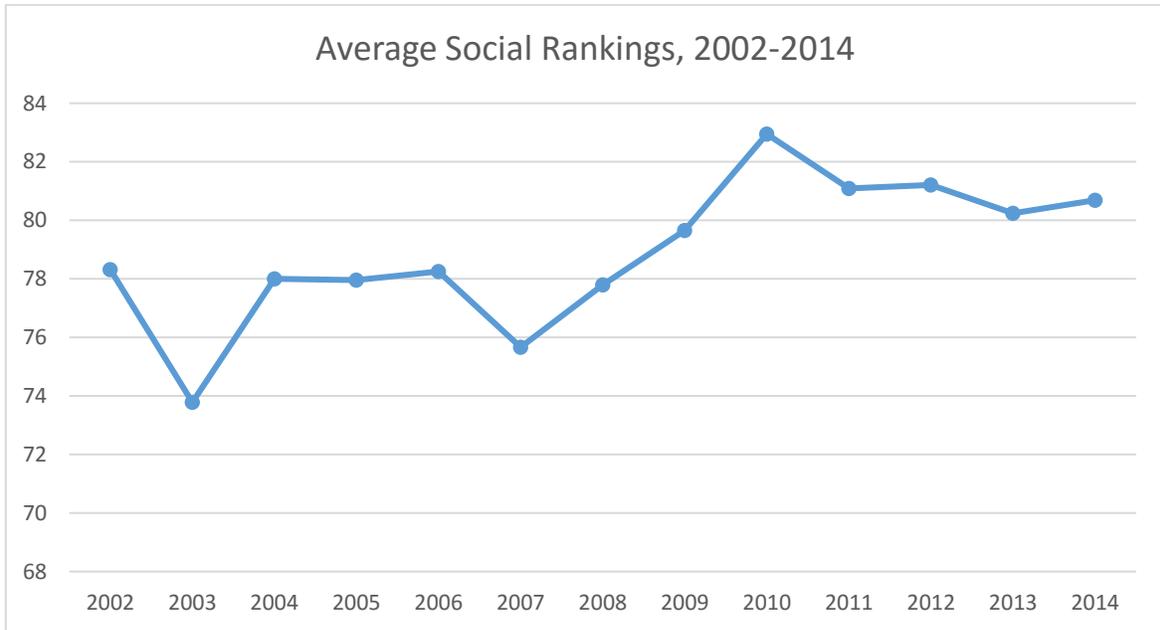


Figure 5. Average Social Rankings of Firms in FTSE 2002-2014

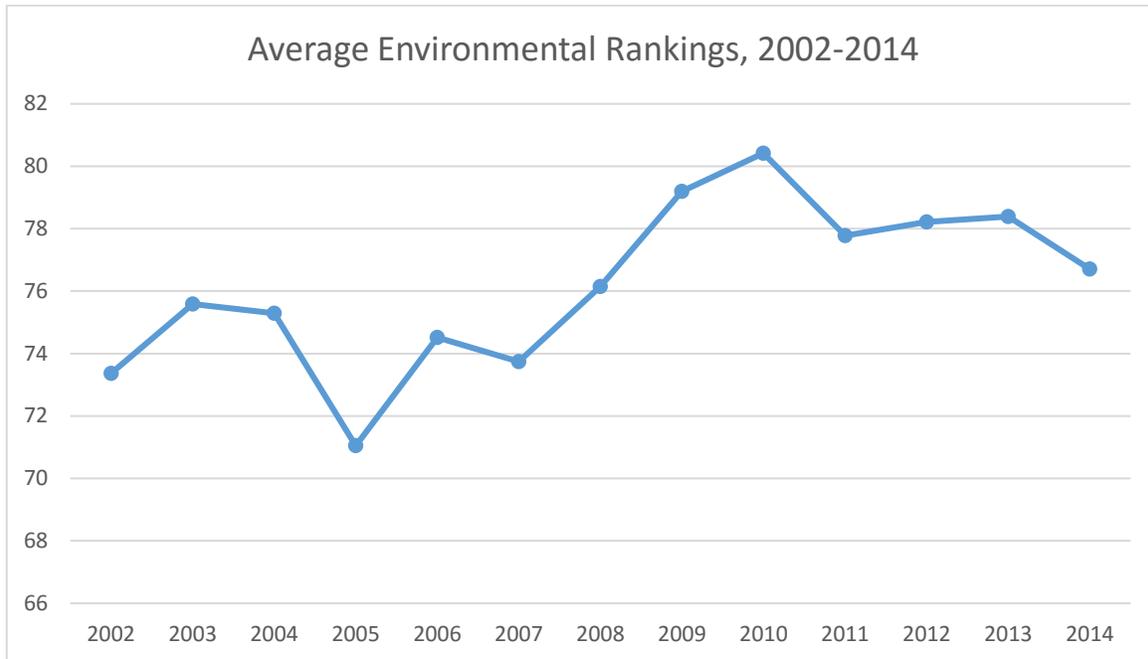


Figure 6. Average Environmental Rankings of Firms in FTSE 2002-2014

The graphs above suggest that Environmental and Social Ratings move closely together from 2007-2014; both ratings fell in 2007 and peaked in 2010. However, this relationship is not detectable before the year 2007. Average social ratings have been slightly higher than average environmental ratings on the FTSE. These graphs could also represent trends in CSR awareness among corporations and investors in the UK from 2002-2014.

Table 3 shows the descriptive statistics for Operating profits margin, social and environmental scores for firms on the HDAX from 2002-2014.

	Operating Profit Margins	Div/Share	Ln (Net Debt)	Social Scores	Environmental Scores
Mean	10.5180	0.8054	16.0356	70.4843	69.3267
Median	9.1500	0.4930	12.3568	83.9700	86.3400
Maximum	55.5500	8.9250	20.2239	98.6600	97.0700
Minimum	0.0300	0	0	4.2600	9.0300
Std. Dev.	8.2827	1.0764	17.6587	27.5657	30.0218
Skewness	2.1160	2.7678	3.8810	-0.9366	-0.8982
Kurtosis	9.9550	10.4993	12.3568	2.5376	2.2067
Observations	1118	1298	1316	1043	1043

Table 2. Descriptive Statistics for Firms in HDAX (2002-2014)

Once again, both Social and Environmental scores are negatively skewed, though for HDAX, minimum scores in both areas are lower than scores by FTSE-100 firms. These scores also have a higher standard deviation than their counterparts in FTSE-100. Operating profits margin for firms on the HDAX have a minimum value of 0.03, as opposed to the negative minimum margin for firms on FTSE-100. These values point toward a possible negative correlation between operating profits margin, Social and Environmental scores.

The following graphs depict the average Social and Environmental Scores for firms on the HDAX from 2002-2014. Similar to the graphs for FTSE-100, these show that the average of the two ratings move closely together from 2008-2014, but appear to be uncorrelated before 2008.

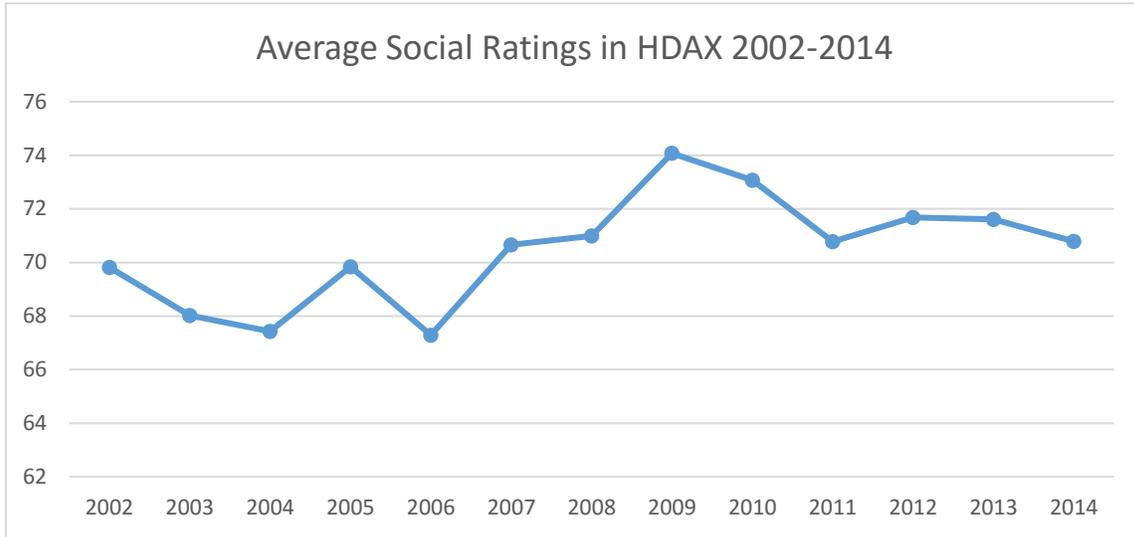


Figure 7. Average Social Rankings of Firms in the HDAX 2002-2014

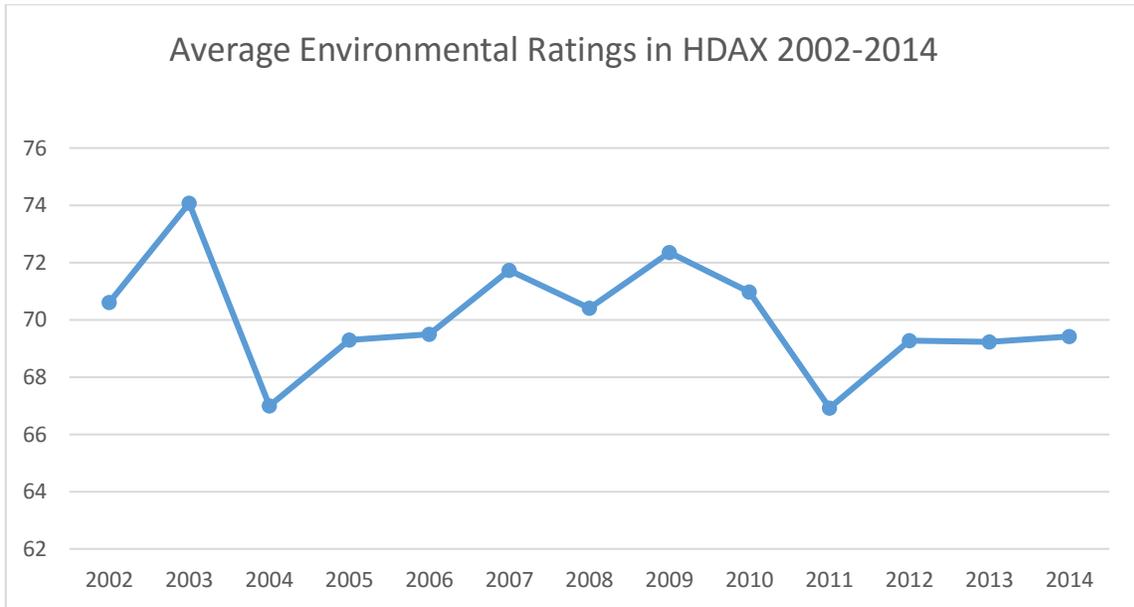


Figure 8. Average Environmental Rankings of Firms in the HDAX 2002-2014

7.2 Relationship between Beta, Environmental and Social Scores

The relationship between firm beta and its ES scores is an interesting one because it allows us to predict the sensitivity of low and high ES stocks to market returns. The graph below depicts a scatter plot of average, decimated Environmental and Social scores for firms on the FTSE-100 over the period 2002-2014, against their beta (calculated from monthly returns for the same period 2002-2014). From this graph, one can surmise that higher betas roughly tend to favor firms with higher ES scores, and vice versa.

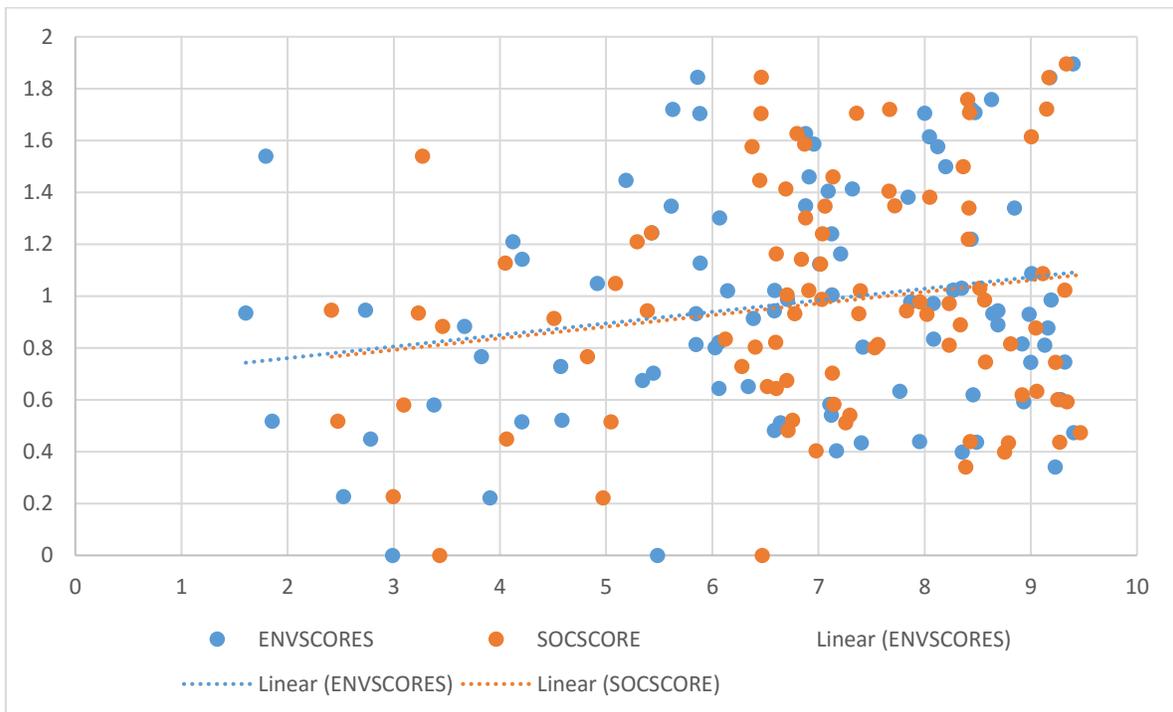


Figure 9. Plot of firms' E and S scores against their Beta (FTSE-100)

This result is not unintuitive. For instance, it may be argued that firms with higher investment in Environmental and Social initiatives are more exposed to systematic risk than the market. But on the other hand, investment in CSR ventures would suggest that overall firm exposure to systematic risk should be *reduced*. The trend could be explained away once firm ES scores are evaluated per component of CSR for their relation with beta. For the purposes of this study, a linear representation of the relationship would suffice. However, given a larger number of observations and a more detailed empirical analysis, a causal link may be found between high ES scores and high firm beta.

The graph below depicts similar results when plotting Environmental and Social scores for firms in HDAX against their beta.

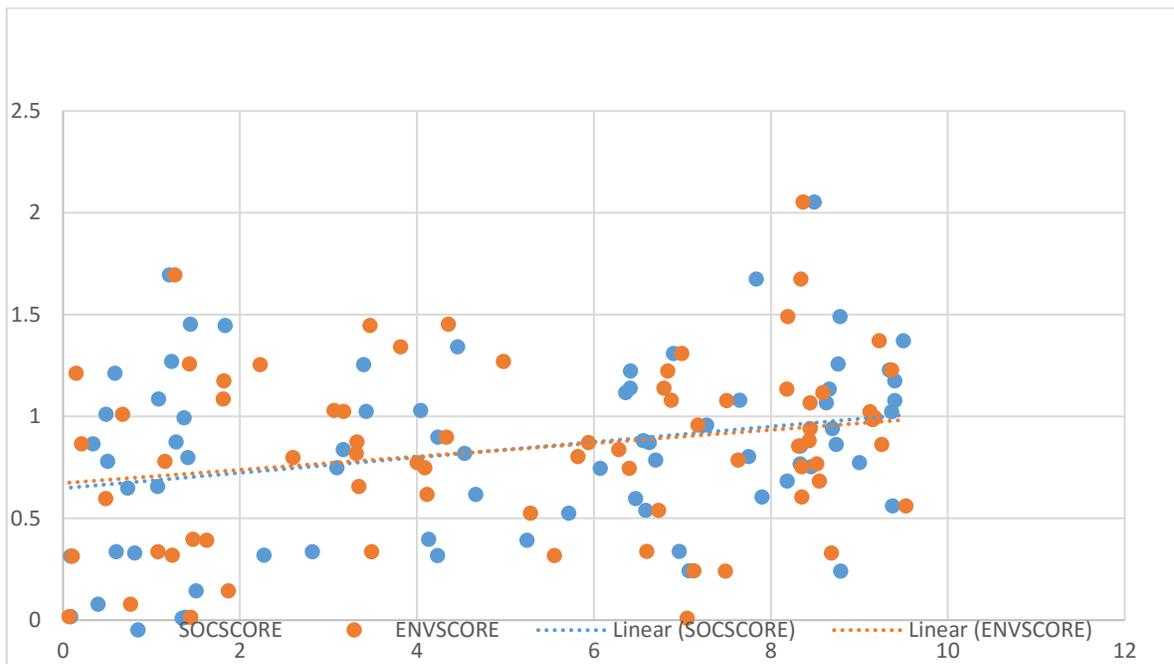


Figure 10. Plot of firms' E and S scores against their Beta (HDAX)

A similar trend can be detected in the HDAX scatterplot, where firms with higher Environmental and Social scores tend to have slightly higher betas. Additionally, the slope of the trendline through HDAX data for both social and environmental scores is smaller than the slope of the trendline through FTSE-100 data, meaning the result is less pronounced.

8 EMPIRICAL RESULTS

This section details the results of the empirical analysis. The section is divided into three subchapters. The first two chapters concern the results of the test of the first hypothesis, breaking it down to the two dependent variables under study, namely the operating profits margin and the dividends per share. In the first chapter, results of the regression of equation (1) are detailed for FTSE-100 and HDAX, while the second subchapter details the results of the regression of equation (2). The third chapter concerns tests of the third hypothesis, with the natural log of net debt as the dependent variable.

8.1 Operating Profit Margins

First, Operating Profit Margins for FTSE firms are regressed against Social and Environmental rankings while controlling for firm size, asset turnover ratio, earnings per share, interest coverage, payout ratio and the market to book value. Least Squares regression with fixed effects cross section is applied to the equation and period weights (PCSE) are used. This is because for this balanced panel data, the number of observations (N) is greater than the number of time periods (T).

The results of this regression for firms in the FTSE 100 are displayed in Table 3.

This table reports results from regressing variables in equation (1) against operating profit margins for companies in the FTSE 100. After removing newly incorporated firms and firms with missing values, there are 91 cross sections across the period 2002-2014, and 1011 observations in total. Least Squares regression with fixed effects cross-section is conducted while using period weights (PCSE). *, ** and *** denote coefficients significant at the 10%, 5% and 1% level respectively.

Variable	<i>Coefficient</i>	<i>Std. Error</i>	<i>Prob.</i>
C	15.493 (7.814)	1.983	0.0000
Earnings Per Share	1.6968 (7.552***)	0.224	0.0000
Asset Turnover	3.5791 (2.871***)	1.246	0.0042
Interest Coverage	0.0035 (5.302***)	0.0006	0.0000
Payout Ratio	0.0042 (0.367)	0.011	0.7155
Market to Book Value	-0.0002 (-0.032)	0.008	0.9746
Total Assets	-1.29E-08 (-5.906***)	2.18E-09	0.0000
CGV-SCORE	0.0459 (2.871***)	0.016	0.0042
ENV-SCORE	-0.0147 (-0.913)	0.016	0.3605
SOC-SCORE	-0.0575 (-3.153***)	0.018	0.0016

Table 3. The Relationship between Environmental and Social Scores and firms' Operating Profit Margin (FTSE100)

Unsurprisingly, both Environmental and Social scores appear to be negatively correlated with Operating Profits Margins. Moreover, the relation between operating profits margin and social scores is significant at the 1% level, while that between OPM and environmental scores is not significant. Based on the results of this regression, we are unable to reject H_1 , which states that firms with high ES scores would have lower operating profits margins. H_0 is however partially accepted for Environmental scores, since no significant relation can be found.

We repeat the regression for firms in the HDAX. Table 5 shows results of the regression, which are very similar to the results for the firms in FTSE-100. However, in HDAX, Market to Book Value ratio has a more significant correlation with operating profits margin than in FTSE-100. Moreover, firm size doesn't appear to be significant for firms' operating profit margin in the HDAX.

Both social and environmental scores are once again negatively related to operating profits margin. For firms in the HDAX, the coefficient for both variables is significant. The coefficient for social scores is significant at the 5% level, while that for environmental scores is significant at the 10% level.

This table reports results from regressing variables in equation (1) against operating profit margins for companies in the HDAX. After removing newly incorporated firms and firms with missing values, there are 72 cross sections across the period 2002-2014, and 668 observations in total. Least Squares regression with fixed effects cross-section is conducted while using period weights (PCSE). *, ** and *** denote coefficients significant at the 10%, 5% and 1% level respectively.

Variable	<i>Coefficient</i>	<i>Std. Error</i>	<i>Prob.</i>
C	5.439922 (3.565***)	1.525780	0.0004
Earnings Per Share	0.362788 (6.409***)	0.056601	0.0000
Asset Turnover	-1.189443 (-1.626)	0.731468	0.1045
Interest Coverage	0.017768 (6.195***)	0.002868	0.0000
Payout Ratio	0.039195 (3.100***)	0.012641	0.0020
Market to Book Value	0.647454 (3.537***)	0.183041	0.0004
Total Assets	-7.91E-10 (-0.317)	2.50E-09	0.7512
CGV-SCORE	0.042542 (2.662***)	0.015981	0.0080
ENV-SCORE	0.029970 (1.680*)	0.017833	0.0934
SOC-SCORE	-0.036913 (-1.967**)	0.018763	0.0496

Table 4. The relationship between Environmental and Social ratings and firms' Operating Profits Margin (HDAX)

Once again, based on these results, we cannot reject H_1 for HDAX firms, since Social scores

in this case show a significant negative relation to operating profits margin. However, Environmental scores are significant only at the 10% significance level and appear to be positively related to operating profits margin.

Based on the results of the first tests, we can conclude that there are marked differences in the effects of CSR practices in both markets. While social scores are negatively related to OPMs in both markets, there are differences in the way environmental efforts are translated on the firms' balance sheets. Another reason for environmental scores to have no significant relation to OPM in HDAX would be the 'voluntariness' of CSR efforts in Germany, where government and corporations have unanimously opposed the incorporation of CSR components in legislature (Beier 2012).

When investigating the relationship between CSR and operating profits margin, it is interesting to note that in both the case of FTSE-100 and HDAX, Corporate Governance scores are significant at 1% levels and positively related to operating profits margins. There may or may not be a causal link in the relationship, but from the face of it firms with better corporate governance tend to outperform those that do not measure up.

8.2 Dividends per Share

This subchapter reports the results of testing the relationship between ES scores and dividends per share. The table below shows the results of this regression of equation (2) for firms in the FTSE-100. Dividends per share are regressed against Environmental and Social scores, while controlling for Earnings per Share, firm size (represented by total assets), market to book value, payout ratio, sales per share and the corporate governance score. Similar to the regression for operating profits margin, least squares regression with fixed effects cross-section is used, while applying period weights (PCSE). After controlling for

variables that affect dividends per share, Environmental and Social scores have no explanatory power over the dependent variable. The coefficients for corporate governance and social scores are positive, while that of environmental scores is negative.

This table reports results from regressing variables in equation (2) against dividends per share for companies in the FTSE-100. After removing newly incorporated firms and firms with missing values, there are 93 cross sections across the period 2002-2014, and 1101 observations in total. Least Squares regression with fixed effects cross-section is conducted while using period weights (PCSE). *, ** and *** denote coefficients significant at the 10%, 5% and 1% level respectively.

Variable	<i>Coefficient</i>	<i>Std. Error</i>	<i>Prob.</i>
C	-0.583636 (-2-263)	0.257805	0.0238
Earnings per Share	0.173465 (12.988***)	0.013356	0.0000
ln(Total Assets)	0.027613 (1.616)	0.017087	0.1064
Market to Book Value	0.000492 (1.379)	0.000356	0.1680
Payout Ratio	0.003085 (5.785***)	0.000533	0.0000
Sales per Share	0.015875 (6.945***)	0.002286	0.0000
CGVSCORE	0.001074 (1.563)	0.000687	0.1183
ENVSCORE	-8.96E-05 (-0.134)	0.000666	0.8930
SOCSCORE	8.16E-05 (0.106)	0.000768	0.9153

Table 5. The relationship between Environmental and Social scores and Firms' Dividends per Share (FTSE-100)

When testing for the relationship between ES scores and dividends per share in HDAX, the results are similar yet more definite. Environmental scores are still not significant for dividends per share, but social scores in HDAX are significant at the 5% level and are positively related to dividends per share. The results are displayed in the table below.

This table reports results from regressing variables in equation (2) against dividends per share for companies in the HDAX. After removing newly incorporated firms and firms with missing values, there are 72 cross sections across the period 2002-2014, and 668 observations in total. Least Squares regression with fixed effects cross-section is conducted while using period weights (PCSE). *, ** and *** denote coefficients significant at the 10%, 5% and 1% level respectively.

Variable	<i>Coefficient</i>	<i>Std. Error</i>	<i>Prob.</i>
C	-3.208503 (-2.669***)	1.202183	0.0078
Earnings Per Share	0.100653 (14.705***)	0.006845	0.0000
ln(Total Assets)	0.154322 (2.048**)	0.075347	0.0410
Market to Book Value	0.065460 (3.283***)	0.019939	0.0011
Payout Ratio	0.007996 (5.438***)	0.001470	0.0000
Sales per Share	0.008637 (7.561***)	0.001142	0.0000
CGVSCORE	0.002790 (1.472)	0.001894	0.1414
ENVSCORE	-0.001005 (-0.459)	0.002187	0.6459
SOCSCORE	0.005597 (2.314**)	0.002418	0.0210

Table 6. The relationship between Environmental and Social scores and Firms' Dividends per Share (HDAX)

According to these results, the null hypothesis (H_0) may be partially rejected (for firms in the HDAX), while H_4 may be partially accepted. This is contrary to the intuitive claim that both environmental and social efforts reduce the dividends paid out to shareholders. The explanation may lie in the theory that value firms in Germany tend to also have higher CSR scores, while growth firms have lower CSR scores. Since value firms pay more dividends than growth firms, the relationship between these variables may be more coincidental than causal.

8.3 Net Debt

This section details the results of the regression of equation (3), where the relationship between Net Debt and environmental and social scores is tested while controlling for other explanatory variables. The reason for testing this relationship is to determine whether firms with higher ES scores tend to finance their CSR activities through borrowing. For this purpose, hypothesis (3) proposes that the relationship between net debt and ES scores should be positive. This hypothesis is tested on the FTSE-100 and HDAX markets consecutively.

Table 7 lists the results of the regression of the logarithm of firms' net debt against their environmental and social scores, while controlling for Interest coverage ratio, Operating income, Payout Ratio, Firm Size and Corporate Governance score for firms in the FTSE-100. Least squares regression with fixed effects cross-section is conducted while using period weights (PCSE).

This table reports results from regressing variables in equation (3) against logarithm of net debt for companies in the FTSE-100. After removing newly incorporated firms and firms with missing values, there are 72 cross sections across the period 2002-2014, and 668 observations in total. Least Squares regression with fixed effects cross-section is conducted while using period weights (PCSE). *, ** and *** denote coefficients significant at the 10%, 5% and 1% level respectively.

Variable	<i>Coefficient</i>	<i>Std. Error</i>	<i>Prob.</i>
C	2.495154 (2.641***)	0.944833	0.0084
Interest Coverage Ratio	-0.009145 (-4.813***)	0.001900	0.0000
ln(Operating Income)	0.104708 (1.952*)	0.053619	0.0512
Payout Ratio	0.002545 (1.865*)	0.001364	0.0625
ln(Total Assets)	0.654952 (10.547***)	0.062096	0.0000
CGVSCORE	-0.004639 (-2.254**)	0.002058	0.0245
ENVSCORE	0.000637 (0.309)	0.002056	0.7569
SOCSCORE	0.001611 (0.739)	0.002183	0.4607

Table 7. The relationship between Environmental and Social scores and firms' net debt (FTSE-100)

The results in the table show that the relationship between ES scores and the logarithm of firms' net debt is positive but insignificant for FTSE-100 firms. The null hypothesis in this case cannot be rejected. While firms in the UK may rely on borrowing to finance CSR activities, there is no significant impact on the net debt on their balance sheets from their CSR policies.

Regression of the same equation is carried out for firms in the HDAX. The table below lists the results of the regression, and these results indicate perhaps the most vivid difference between the German and UK markets.

This table reports results from regressing variables in equation (3) against logarithm of net debt for companies in the HDAX. After removing newly incorporated firms and firms with missing values, there are 72 cross sections across the period 2002-2014, and 668 observations in total. Least Squares regression with fixed effects cross-section is conducted while using period weights (PCSE). *, ** and *** denote coefficients significant at the 10%, 5% and 1% level respectively.

Variable	Coefficient	Std. Error	Prob.
C	-5.944463 (-3.397***)	1.749765	0.0007
Interest Coverage Ratio	-0.026692 (-5.119***)	0.005213	0.0000
ln(Operating Income)	-0.039658 (-0.704)	0.056308	0.4816
Payout Ratio	-0.001771 (-0.934)	0.001896	0.3507
ln(Total Assets)	1.329587 (11.821***)	0.112479	0.0000
CGVSCORE	-0.000861 (0.343)	0.002505	0.7312
ENVSCORE	-0.004290 (-1.404)	0.003056	0.1610
SOCSCORE	-0.004876 (-1.579)	0.003089	0.1151

Table 8. The relationship between Environmental and Social Scores and Firms' net debt (HDAX)

While the relationship between ES scores and the logarithm of firms' net debt is still insignificant for firms in the HDAX, this relationship is now negative. Hypothesis 3 is therefore rejected for firms in the HDAX. If anything, firms with higher involvement in CSR tend to have *lower* net debt. One reason for the difference may be the tendency for German firms to have a lower debt-to-equity ratio than firms in the UK. This however, does not explain the negative relationship between debt and ES scores.

9 CONCLUSION

While Corporate Social Responsibility and its implications for a firm's value and profitability have been active concerns since the 1950's, market perceptions of participation in CSR activities have changed over the decades. Whereas in the past, CSR initiatives may have represented a badge of merit for the company in question, in recent years, these behaviors are expected in the course of a business's operations. Higher demand for CSR among investors and consumers has led to increased competition between large corporations, and hence returns on additional CSR activities are expected to have decreased over the years. However, operational costs of undertaking and maintaining good social and environmental practices are still a leading concern for businesses.

While the effects of good governance practices on stock price and profitability have been studied in depth in recent years, the effects of environmental and social aspects of CSR on a firm's balance sheet still remains a relatively underdeveloped area in financial research. In this study, the correlation between Environmental and Social scores, and operating profit margins, dividends per share and net debt are studied for firms in the FTSE-100 and the HDAX. Since both are developed markets with approximately similar socio-economic statistics, there is expected to be an equally high demand for CSR in both countries.

The results indicate that the studied variables (OPM, Div/Share and Net debt) tend to have higher correlations with E and S scores for firms in the HDAX than in FTSE-100. In particular, OPM has the highest correlation with E and S scores, yet while it is positively correlated with the Environmental score, there is negative correlation with the Social score. One explanation for this could be reverse causality, i.e., firms with higher OPMs tend to invest more in Environmental responsibility, and firms with lower OPMs tend to invest more in Social responsibility. Another explanation could be the higher operating costs of 'social'

projects, such as employee benefits and salaries, as opposed to the higher fixed costs of ‘environmental’ initiatives, such as investment in eco-friendly resources and energy supplies.

Lastly, while there are similarities in the direction of correlation between both markets for Operating Profits Margins and Dividends per share, the FTSE-100 firms’ net debt has a positive insignificant correlation with both E and S scores, while the HDAX firms’ net debt has a negative insignificant correlation. One explanation for this observation could be that firms in the UK have a higher ratio of debt-to-equity as opposed to firms in Germany. Firms in the FTSE-100 are therefore more likely to finance Environmental and Social activities through borrowing than firms in the HDAX.

10 FURTHER RESEARCH

So far, the correlation between Social and Environmental factors for firms' operating profit margins, dividends per share and net debt has been studied in two separate markets, the HDAX and the FTSE-100. The markets themselves, although operating in separate countries, and governed by a separate set of corporate equity laws, are similar in geography and level of development of the economy. Germany being the largest economy in Europe, and Britain the second largest, the two markets share similarities that in turn effect the similarities in the correlations discovered. In addition to these parallels, the results reflect the differences in perception of CSR in the two markets. Therefore, it would be interesting to distinguish the specific variables in firm management that drive those differences and vice versa.

Moreover, applying similar regressions on economies across the developed and developing world can help establish how firms in different countries perceive CSR differently, and how their actions have varying effects on firm and shareholder profitability. This in turn will allow the construction of a model that can determine, given geographic constants, the expected economic impact of decisions relating to corporate, social and environmental responsibility. This will reduce decision time and improve estimation of results for a firm's CSR based policies.

Another possible development from this research is an explorative study that determines the changes in demand and supply of CSR over the past decade. Building on previous research by McWilliams (2001) and Wood (2008), the study would build and improve upon the existing model by specifying updated determinants for the demand for CSR activities and the supply of CSR reporting. While Mackey et al. (2007) employ a model to determine the changes in firm value through changes in CSR, a similar model may be reemployed to determine the increase (or decrease) in supply and demand of CSR over the years by studying the increase (or decrease) in firm value over the years. In addition, the costs and benefits of CSR may be factorized based on a firm's market capitalization, industry and country of

operations, and this data would in turn be used in a cost-benefit analysis to determine optimum involvement in CSR activities.

There are numerous options of economies and market conditions to conduct research on optimization of CSR decision making. What holds true for Europe may not hold true for the U.S., and even less so for China, Japan, Taiwan or India. This is because firm decisions with regards to CSR policy are largely behavior based, and often prejudiced by the sensitivity of the market to CSR and current laws and regulations. However, this in itself is not always a certainty, as seen in Germany, where CSR regulations tend to be laxer in comparison to the U.K, and in spite of this CSR involvement appears to be higher. These studies will therefore not only be of use to the firms of the countries they research in policy-making and implementation, but also provide valuable insight into the behavioral and operational responses to CSR as shaped by economic, administrative and ethical concerns.

11 REFERENCES

- Albuquerque, Rui, Art Durnev & Yrjo Koskinen (2014). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. Discussion Paper. *Center for Economic Policy Research*. Available online: www.cepr.org/pubs/dps/DP9533.asp
- Ball, Ray, Joseph Gerakos, Juhani T. Linnainmaa & Valeri Nikolaev (2014). Deflating Profitability. Chicago Booth Paper No. 14-10. Available Online: http://www.bengrahaminvesting.ca/Outreach/Symposium/2014_papers/Linnainmaa.pdf
- Bebchuk, Lucian, Alma Cohen & Allen Ferrell (2009). What matters in Corporate Governance? *The Review of Financial Studies* 22.2, pp. 783-827.
- Beier, Julia (2012). CSR ‘Made in Germany’: Are Voluntary Standards Enough? *Business for Social Responsibility*. Available online: <http://www.bsr.org/en/our-insights/blog-view/csr-made-in-germany-are-voluntary-standards-enough>
- Brealey, Richard, Stewart Myers & Franklin Allen (2011). *Principles of Corporate Finance*. 10th edition. New York: McGraw-Hill.
- Capelle-Blancard, Gunther & Marie-Aude Laguna (2001). How does stock market respond to chemical disasters? *Journal of Environmental Economics and Management* 59.2, pp 192- 205.

- Carroll, Archie B. & Kareem M. Shabana (2010). The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice. *International Journal of Management Reviews* 1111.10
- Carroll, Archie B. (2008). A History of Corporate Social Responsibility: Concepts and Practices. *The Oxford Handbook of Corporate Social Responsibility*
- Cochran, Philip L. & Robert A. Wood (1984). Corporate Social Responsibility and Firm Performance. *Academy of Management Journal* 27.1, pp 42-56.
- Crisostomo, Vicente Lima, Fatima de Souza Freire & Felipe Cortes de Vasconcellos (2011). Corporate Social Responsibility, firm value and financial performance in Brazil. *Social Responsibility Journal* 7.2, pp. 295-309.
- Drucker, Peter F. (1984). The New Meaning of Corporate Social Responsibility. *California Management Review* 26.2, pp 53-63
- Fama, Eugene F. & Kenneth R. French (1992). The Cross Section of Expected Returns. *The Journal of Finance* 47.2
- Flammer, Caroline (2012). Corporate Social Responsibility and Stock Prices: The Environmental Awareness of Shareholders. Available online: <http://corporate-sustainability.org/wp-content/uploads/arcs-2012-Flammer.pdf>
- Ghoul, Sadok El, Omrane Guedhami, Chuck C. Y. Kwok & Dev R. Mishra (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking and Finance* 35.9, pp. 2388-2406.
- Heinkel, Robert, Alan Kraus & Josef Zechner (2001). The Effect of Green Investment on Corporate Behavior. *Journal of Financial and Quantitative Analysis* 36.4.

Jo, Hoje & Maretno A. Harjoto (2011). Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility. *Journal of Business Ethics* 103.3, pp. 351-383.

Kinderman, Daniel (2012). 'Free us up so we can be Responsible!' The co-evolution of Corporate Social Responsibility and neo-liberalism in the UK, 1977-2010. *Socio-Economic Review* 10.1, pp 29-57.

KLD Research & Analytics, Inc (2015). "KLD Ratings Data: Inclusive Social Rating Criteria".

McWilliams, Abigail & Donald Seigel (2001). Corporate Social Responsibility: A Theory of the Firm Perspective. *Academy of Management Review* 26.1, pp 117-127.

Moura-Leite, Rosamaria C. & Robert C. Padgett (2011). Historical background of Corporate Social Responsibility. *Social Responsibility Journal* 7.4, pp 528-539.

Novy-Marx, Robert (2013). The other side of value: The operating profits premium. *Journal of Financial Economics* 108.8, pp. 1-28.

OECD (2016), Non-Financial corporations debt to surplus ratio (indicator). doi: 10.1787/dc95ffa7-en (Accessed on 13 July 2016)

OECD (2016), Financial corporations debt to equity ratio (indicator). doi: 10.1787/a3108a99-en (Accessed on 13 July 2016)

Reinhardt, Forest L., Robert N. Stavins & Richard H. K. Vietor (2008). Corporate Social Responsibility Through an Economic Lens. *Review of Environmental Economics and Policy* 2.2, pp. 219-239.

Servaes, Henri & Ane Tamayo (2013). The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness. *Journal of Management Science* 59.5, pp. 1045-1061.

Tristano, Darren (2016). The Cost of Corporate Social Responsibility. *Forbes – Food and Agriculture*. Available online: <http://www.forbes.com/sites/darrentristano/2016/01/04/the-cost-of-corporate-social-responsibility/#e7fed5247f7b>

Windsor, Duane (2001). The Future of Corporate Social Responsibility. *The International Journal of Organizational Analysis* 9.3, pp. 225-256.