

Discussion Paper No. 14-100

**The Effects of Corporate and  
Country Sustainability Characteristics  
on the Cost of Debt:  
An International Investigation**

Andreas Hoepner, Ioannis Oikonomou,  
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# **The Effects of Corporate and Country Sustainability Characteristics on the Cost of Debt: An International Investigation**

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## ABSTRACT

We investigate the relationship between corporate and country sustainability on the cost of bank loans. We look into 470 loan agreements signed between 2005 and 2012 with borrowers based on 28 different countries across the world and operating in all major industries. Our principal findings reveal that country sustainability related to both social and environmental frameworks has a statistically and economically impactful effect on direct financing of economic activity. An increase of one unit in country sustainability scores is associated with an average decrease in the costs of debt by 64 basis points. Our analysis shows that the environmental dimension of a country's institutional framework is approximately two times as impactful as the societal dimension when it comes to determining the cost of corporate loans. On the other hand, we find no conclusive evidence that firm-level sustainability influences the interest rates charged to borrowing firms by banks.

**Keywords:** corporate social responsibility; CSR; CSP; sustainability; banking; financial contracts; culture

**JEL Classification:** G14, G32, M14

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# 1. Introduction

Corporate Social Responsibility<sup>1</sup> (CSR) has firmly established itself as a crucial notion for modern business and society on an international level. Consumers, environmentalists, employees, activists and concerned citizens have been pushing corporations for many years to go beyond their purely economic goals and attempt to improve their impact on society and the natural environment in broader ways. The latest Nielsen Global Survey on Corporate Social Responsibility was conducted in 2013 with 29,000 respondents from 58 countries and demonstrates that at least 50% of global consumers are willing to pay a premium for goods and services coming from socially responsible firms. The trend is for this percentage to keep rising as it has from the previous related survey conducted by Nielsen in 2011. Thus, societal pressure moves from the area of implicit reputational gains to explicit financial incentives for responsible producers and, vice versa, the lack of socially responsible practices (or even worse, the engagement in social/environmental controversies) constitutes a competitive disadvantage. This is also recognised by European Commission's renewed strategy for CSR (2011-2014), according to which CSR "can bring benefits in terms of risk management, cost savings, access to capital, customer relationships, human resource management, and innovation capacity". Indeed, the business world seems to have been convinced about the fundamental significance of responsible practices. According to the UN Global Compact–Accenture CEO Study on Sustainability, conducted in 2013 with the participation of more than 1,000 top executives from 27 industries and 103 countries, 93% of respondents see sustainability issues as an important or very important factor to the future success of their business.

It is, therefore, unsurprising that considerable research efforts have been made to identify the details of the association between Corporate Social Responsibility and financial performance of individual firms as well as portfolios of assets. The conceptual breadth and methodological diversity characterising this extensive literature over a span of 40 years has led to contradictory evidence being brought forward by hundreds of empirical studies. Nevertheless, both qualitative reviews (Margolis and Walsh, 2003) and statistical meta-analyses (Margolis et al., 2009; Orlitzky et al., 2003) hint towards a modest but statistically significant correlation between the two concepts.<sup>2</sup> The underlying arguments in favour of this positive link between CSR and firm

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<sup>1</sup> Concisely described by the European Commission as a concept whereby "companies are taking responsibility for their impact on society", [http://europa.eu/rapid/press-release\\_MEMO-11-730\\_en.htm](http://europa.eu/rapid/press-release_MEMO-11-730_en.htm)

<sup>2</sup> However, when focusing either on fund performance (Kreander et al., 2005) or index performance (Schröder, 2007) there are usually no significant differences to be found between the performance of

performance can broadly be categorised in two groups. The first one draws from instrumental stakeholder theory (Freeman, 1984; Jones, 1995) and posits that the efficient implementation of CSR policies and practices can lead to effective stakeholder management on the part of the firm. Establishing mutually beneficial long-term relationships with key constituents can bring about the generation of multiple comparative advantages for the firm both in terms of improved profitability (Clarkson, 1995; Hillman and Keim, 2001) and better risk management (Godfrey, 2005). In other words, building trusting relationships with primary stakeholders by addressing their legitimate needs and concerns (ideally on a proactive basis), through CSR, creates reputational wealth and relational capital for the firm and can ultimately lead to an improved corporate valuation or to the preservation of value during turbulent times.

A second line of reasoning commonly used to support a positive association between CSR and firm performance is often referred to as “the good management hypothesis” (Alexander and Buchholz, 1982; Waddock and Graves, 1997). This hypothesis suggests that high levels of sustainable business practices can be viewed as signaling supremely competent and trustworthy corporate managers. The effective application of CSR is a very complex task which requires the consideration of the relative importance of claims made by a plethora of different stakeholder groups (often contradicting each other) and the estimation of both explicit and implicit costs and benefits accruing from the related practices to the firm. Consequently, executives who choose to use CSR for strategic purposes can be viewed as being highly skilled.

Interestingly, although the aforementioned arguments can be used to motivate research on the financial impacts of CSR related to either the equity or debt valuation of the firm, the majority of the relevant studies focus on identifying the influence of CSR on the cost of equity capital (Kempf and Osthoff, 2007; Galema et al., 2008; Hong and Kacperczyk 2009; El Ghoual et al., 2011). It has only been in the last few years that some attention has been paid to the possibility of a linkage between CSR and cost of debt. The sheer size of the corporate debt market and its importance on a global scale merits such investigations. According to McKinsey, as of 2012, global equity is estimated to aggregate to \$50 trillion whereas total corporate debt amounts to \$86 trillion<sup>3</sup>. An additional reason to motivate such research comes from the view that distinguishing good management via a firm’s CSR levels is even more important in the debt

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conventional and Socially Responsible Investing (SRI) funds. And this is despite SRI funds being true to their name and investing in more sustainable firms compared to their conventional peers (Kempf and Osthoff, 2008).

<sup>3</sup> McKinsey Global Institute analysis, available online at [http://www.mckinsey.com/insights/global\\_capital\\_markets/financial\\_globalization](http://www.mckinsey.com/insights/global_capital_markets/financial_globalization)

markets due to the agency conflicts arising between shareholders and debt-holders (Ashbaugh-Skaife et al., 2006). Merton's (1973) seminal work has demonstrated that the payoffs accruing from a corporate bond (the extension to corporate loans is straightforward) is asymmetric and resembles that of a put position. This is because the potential benefits for the borrower are capped at the level of accruing interest payments whereas the potential losses can be as much as the entirety of the borrowed capital. In contrast, for shareholders, the gains are potentially unlimited. This distinction makes the imperative to identify competent and responsible firm managers in order to reduce agency and monitoring costs more important for debt-holders compared to equity-holders.

It should also be noted that from the \$86 trillion of outstanding corporate debt globally previously mentioned, \$75 trillion (or approximately 87%) relates to securitized or nonsecuritized bank loans and \$11 trillion are connected to corporate bonds outstanding. Bradley and Roberts (2004) also report that private debt, including bank loans, tends to be at least two to three times the amount of public debt. Apart from their differences in order of magnitude, the role of banking institutions as "quasi insiders" (Goss and Roberts, 2011) provides a basis to assert that the loan market is more efficient than the bond market and as such, the financial effects of CSR will be more prominently exhibited there. Banks have access to unique information related to a firm's operational and financial standing, a specialised skillset needed to appropriately assess this information in order to make a lending decision and the privilege of being able to set the terms regarding the monitoring of the borrower during the duration of the loan. Therefore, it is sensible to expect a greater degree of market efficiency in the corporate loans market. Altman et al. (2010) have in fact concluded that syndicated loan markets are more informationally efficient compared to bond markets as they manage to reflect the probability of default more quickly.

Based on the above, it is surprising that more emphasis has been given to the likely impact of CSR on the cost of internal debt financing, i.e. through bond issuance, compared to the effects of CSR on external debt financing, i.e. through bank lending. Not only is this part of the empirical literature scarce in terms of overall number of studies, it is also underdeveloped in a variety of ways, as we will demonstrate in our perusal of related research in the next section of this paper. We aim to extend previous work on the financial impacts of corporate social responsibility by: i) Focusing on the link between CSR and cost of debt (which has not been extensively researched, unlike the cost of equity), and more specifically on the cost of banks loans (which have received less attention compared to financing through bond issuance), ii) Providing an international framework of analysis using a sample comprised of borrowers from

28 countries around the globe instead of solely focusing on US and European firms, iii) Linked to the previous point, we aim to connect the cost of loans not just to CSR performance indicators at the firm level but also to country related sustainability scores that assess the respective institutional frameworks, iv) Going beyond looking purely at aggregate CSR scores and identify possible variability in the financial impacts of particular CSR dimensions and sub-dimensions, v) Chronologically extending previous analyses in order to include evidence from the years of the global credit crisis which may have altered the nature or strength of the CSR-cost of debt link.

Our main results are indicative of the complexity and variability of the economic impacts of CSR on the cost of debt. We find that the sustainability framework of a borrower's country, and every dimension comprising this framework, is significantly negatively related to corporate borrowing costs. An increase by one unit in the overall country sustainability metric we utilise leads to a significant average decrease of 69 basis points in our sample (or 52% in average corporate loan spread over LIBOR). The intuitive explanation is that these institutional mechanisms act as a shield for the borrowing firm, protecting it from the operational and reputational hazards occurring from systemic social and environmental challenges and ultimately reducing its default risk. On the other hand, improved overall performance in CSR terms is not shown to be associated with the cost of bank loans and particular elements of CSR even appear to be positively linked to credit costs. When extending our analysis to the various components of sustainability, we provide evidence that the environmental aspect of country sustainability is more financially impactful than the social. A unitary increase in the former leads to an average decrease in the corporate cost of debt by approximately 80 basis points compared to approximately 50 basis points for an equivalent decrease in the latter. These results are consistent when looking at various subcategories within each dimension of country sustainability. The model specifications we use to conduct our investigation includes an extensive array of country, industry, borrower, lender and facility characteristics, explain approximately 50% of corporate loan spread variability and provide economically intuitive results with regard to the sign and value of known cost of debt determinants.

The remainder of the paper is structured as follows: Section 2 provides a summary of the extant literature and the conceptual basis guiding our empirical tests. Section 3 outlines the data sources that have been used and the methodology implemented while section 4 describes the results of our analyses. Section 5 discusses the practical importance of the inferences that can be drawn and makes suggestions for further research in this area.

## 2. Related literature and development of hypotheses

The traditional approach of banks in their effort to assess the credit quality of an institution seeking to borrow funds has been to base this assessment on quantitative, easily verifiable by third parties, reasonably objective data which is usually financial in nature (e.g. profitability, current operational leverage, liquidity, market value, credit ratings assigned by rating agencies etc.). This emphasis on “hard information” is the defining characteristic of “transaction-based banking” (Gropp, Gruend and Guettler, 2013). In contrast, with “relationship banking” the lending decisions are based, in addition to the above, on “information which is harder to accurately summarize in a numeric score” (Petersen, 2004), often collected in person, difficult to verify by third parties and more subjective in nature (e.g. managerial competence, trustworthiness, innovative thinking etc), or “soft information. As Goetzmann, Ravid, Sverdlove and Pons-Sanz (2007) note, there is no single, clear definition of what the term “soft information” precisely captures”, so the distinction between hard and soft information is made by noting the above characteristics. This somewhat contrasts with the growing literature which shows that the use of non-financial factors (commonly captured by soft information) can lead to more accurate predictions of corporate credit quality compared to the sole use of purely financial factors (Grunert, Norden and Weber, 2005).

We posit that a firm’s CSR or sustainability performance falls under the umbrella of soft information that banks may consider when taking lending decisions<sup>4</sup>. We have already noted that stakeholder theory (Freeman, 1984; Jones, 1995) suggests that improved corporate social performance can lead to better stakeholder management which can, in turn, materialise to a more reliable and effective business model, thus creating strategic comparative advantages and positively influencing the firm’s financial performance. In the case of the cost of bank loans in particular, a case can be made that CSR will have a direct influence on a variety of factors which determine credit costs. We analyse the link between sustainability and each of these factors, drawing from the arguments and conclusions of previous research, in the following paragraphs.

Recent findings coming from the empirical CSR literature have demonstrated the existence of a link between improved CSR and reduced information asymmetry. Cui, Jo and Na (2012) are

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<sup>4</sup> The development of multiple ratings and numeric scores which are used as proxies of CSR may seem to go against this statement. However, these are really what Petersen (2004) refers to as “hardened soft information” instead of hard information per se. Although they have been quantified, the nature of the related data collection process and score assignment makes them much more subjective compared to, for example, standard accounting ratios.

taking the view of Jo and Harjoto (2011, 2012) who posit that firms use CSR engagements as a mechanism to increase informational flow and improve communication to non-investing stakeholders, thereby enhancing conflict-resolution and decreasing information asymmetries. Their study pays special attention to the possible endogeneity existing between CSR and information asymmetry and concludes that the causality of the relationship causality runs from the former to the latter. In a similar vein, Cho, Lee and Pfeiffer (2013) present findings in favour of a negative association between CSR and information asymmetry (as proxied by stock bid-ask spreads). They argue that this is due to the tendency of CSR to be connected with increased voluntary disclosures which reveal management's ethical concerns and improve the transparency and reliability of financial reporting. The conceptual link between information asymmetry and the cost of bank loans is somewhat more obvious. The higher and better quality the informational flow between two contracting parties is, the lower the monitoring, policing and agency costs tend to be and thus the lower the overall cost of bank financing (Akerlof, 1970; Grossman and Stiglitz, 1980; Mankiw, 1986). In addition, the study of Dennis and Mullineaux (2000) clearly demonstrates that increased informational transparency leads to increased "saleability" of a debt contract.

Corporate social responsibility has also been connected with trustworthiness, integrity, non-opportunistic behavior and an indication of the underlying moral character of a firm. Jones (1995, p.412) notes that "There is another way to reduce opportunistic behavior, however – the voluntary adoption of standards of behavior that limit or eliminate it" and discretionary CSR engagements certainly fit this description. Godfrey (2005) argues that certain aspects of CSR can be viewed as legitimate indications of corporate benevolence and can generate positive moral capital as stakeholders feel they can genuinely trust the corporation. Yoon et al. (2006) also show that CSR activities can improve a company's public image and make it seem more trustworthy to consumers so long as it can convincingly demonstrate that it focuses on CSR per se and not on CSR advertising.

Although trust is a central issue in the world of finance and banking, its effects on financial decision-making had not been researched extensively until recently (Sapienza, 2009). In the context of lending decisions made by banks, trust is mostly related to the "willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Mayer et al., 1995, p.712). The trustor in this case is the bank and the expected action is the full and timely repayment of the loan subject to the terms of the contract.

Indications of opportunistic behavior on the part of the borrower would lead to greater mistrust by the lender and consequently to a need for more stringent monitoring and higher screening and enforcement costs which increase the effective cost of debt. Karlan (2007) shows that cultural similarity and geographic proximity have significant effects in group lending outcomes. He argues that socially connected individuals may trust and value their relationships more as well as that they share information more easily, thus lowering the respective costs. Most notably, Kim, Surroca and Tribo (2014) also highlight the importance of trust in financial decisions, and lending in particular, and argue that it is dependent on two characteristics of the borrower, as perceived by the lender, namely integrity and benevolence (Howorth and Moro, 2012). They base their arguments and empirical investigation on the work of Mayer et al (1995) who define benevolence as “the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive” (p.718) and integrity as a concept which “involves the trustor's perception that the trustee adheres to a set of principles that the trustor finds acceptable” (p.719).

The above arguments substantiating the linkages between sustainability and “soft characteristics” (trustworthiness, integrity, benevolence, non-opportunistic behaviour) of the borrower and between these characteristics and loan terms have been analysed mainly at the level of the firm. However, there is important scholarly work which extends the framework of analysis to the level of the country where the firm is based. In a very interesting study, Cai, Pan and Statman (2014) find that differences in investments in CSR are associated with various aspects of country socio-economic development and culture including, among others, civil liberties, political rights, levels of autonomy and individualism and levels of corruption. In addition, the relationship between culture and economic behaviour has been established in regards to very different phenomena. Bottazzi, Rin and Hellmann (2007) find the extent to which venture capitalists fund certain entrepreneurs, and the terms of this funding, is significantly dependent on how much they trust citizens of these countries according to their cultural traits. Licht, Siegel and Schwartz (2011) also look into the financial effects of cross-country cultural differences (with a focus on egalitarianism) and find it materially affects the international flows of equity and debt as well as the mergers and acquisitions activity between countries. Furthermore, Giannetti and Yafeh (2012) show that when lead banks consider the borrower to be culturally distant from them they apply higher interest rates on the loans and are more likely to demand third-party guarantees. The authors argue that culture plays an important role in the effectiveness of the communications between lender and borrower as well as the organizational structure of the latter, hence influencing the terms of the loan.

In summary, there are ample conceptual linkages, supported by empirical evidence, between CSR and country and/or borrower features and between these features and the cost of debt. CSR reduces informational asymmetries between the contracting parties, increases trust by increasing the perceived integrity, benevolence and trustworthiness of the borrower, and reduces the expectations of opportunistic behavior taking place. By doing so, it leads to reductions in monitoring, policing and bonding costs and to overall reduced cost of debt. Thus, the principal hypotheses our study is investigating are:

*Hypothesis 1: The overall sustainability framework of a borrower's country is inversely associated with the borrower's cost of direct financings*

*Hypothesis 2: The corporate sustainability characteristics of a borrowing firm are inversely associated with its direct cost of financing.*

Going a step further, we attempt to look into the likely difference in the financial impact of separate dimensions of sustainability, namely the social and the environmental one. Godfrey et al. (2009) have argued that combining distinct features of sustainability to create “a single, monolithic construct” (Godfrey et. al, 2009, p.426) actually dilutes the observable financial effects of unidimensional CSR. While the environmental aspect of sustainability has frequently been studied separately and found to be positively related to different aspects of firm financial performance (Belkaoui, 1976; Blacconiere and Northcut, 1997; Sharfman and Fernando, 2008; Bauer and Hann, 2010), the societal dimension is usually “hidden” by being a constituent of aggregated measures of sustainability (Waddock and Graves, 1997; Hillman and Keim, 2001; Nelling and Webb, 2009) while there are also occasions when it has been shown to exhibit a less significant and even negative influence to corporate financial performance (Ziegler et al., 2007). This may be connected to Clarkson’s (1995) view that corporations attempting to deal with broad social issues instead of targeting concerns of primary stakeholder groups will not be seeing any sizeable corresponding effect to their bottom line. Hence, we anticipate that within the framework of this study:

*H3: The financial impact of the environmental side of firm and country sustainability will be more pronounced compared to the societal one.*

In spite of the substantial foundation provided by the aforementioned, the literature specifically focusing on the effects of CSR on the cost of bank loans is scarce. Goss and Roberts (2011) were amongst the first to explore this link. Their study focuses on the US bank loan market in

the years 1991 to 2006, thus stopping before the start of the global financial crisis. They provide evidence that, overall, less responsible firms pay a modest premium ranging between 7 and 18 basis points over more responsible ones. However, the financial effects of discretionary CSR investments are more equivocal. When splitting their sample according to borrower quality, the authors show that low-quality borrowers engaging in discretionary CSR practices face higher loan spreads and shorter maturities, whereas lenders are unaffected in their decision regarding high-quality borrowers engagements in discretionary CSR.

On the other hand, Nandy and Lodh (2012) solely examine the effects of the environmental dimension of sustainability on bank lending decisions. Their sample is also comprised exclusively of US firms and covers the loan facilities which have been agreed between 1991 and 2006. They establish that more eco-friendly firms, on average, tend to agree less costly loans with more favourable contractual terms by banks. In addition, the total amount and duration of the loans seem to be positively associated with the borrower's environmental performance. The economic significance of their results concerning cost of debt is rather small, as a unitary increase in corporate environmental scores is associated with a drop of average spreads of merely 8 basis points.

Lastly, Kim, Surroca and Tribo (2014) conduct an international analysis specifically aimed at unveiling the impact of ethical behaviour (and not sustainability or CSR more broadly) on the cost of syndicated loans. They use a sample covering loan agreements related to 19 different countries for the period 2003 to 2007. Their overarching results suggest a significant reduction of loan rates, approximately 25% in the mean spread, associated with increases of one standard deviation in the degree of borrower's ethical behavior. Furthermore, the authors provide indications that ethical compatibility between borrower and lender can lead to further reductions in bank loan rates. Their principal conclusions survive an array of robustness tests and alternative specifications.

As can be seen, previous studies on the effects of sustainability are restricted in terms of either geographic coverage (with Goss and Roberts (2011) and Nandy and Lodh (2012) focusing only in the US), or in the aspects of CSR they examine (Nandy and Lodh (2012) on environment, Kim et al. (2014) on business ethics) or in the time-frame of their dataset (none goes beyond 2007 and thus they do not account for the possible influences of the global credit crisis on the investigated phenomenon). Our study aims to fill these gaps and, in addition, is, to the best of our knowledge, the first to also look into the effects of country sustainability on the cost of indirect corporate financing.

### 3. Data and methodology

Our measures of country and corporate sustainability are provided by oekom research AG (simply referred to as oekom hereafter). Oekom has established itself as one of the leading independent sustainability rating agencies globally, currently covering an investment universe of more than 3,400 corporations worldwide and being a partner of a multitude of financial service providers and institutional investors. The agency's rating system is based on a comprehensive framework created through the dynamic assessment of more than 100 indicators which are used to generate both country and company sustainability ratings. Ratings are produced for the overall country/company sustainability as well as for the social and environmental performance dimensions separately. The ratings' scale for overall sustainability ranges from D-(poor performance) to A+(excellent performance) but a more precise numeric scale is also produced and ranges from 1 (poor performance) to 4 (excellent performance) and from 0 to 4 for the various sustainability subcategories. In the evaluation process, oekom uses information that has been created by the firm (i.e. corporate disclosures) as well as information that has been generated by external sources. Recognising that different industries are sensitive to different key factors, can lead to the creation of diverse types of social and environmental externalities and thus can be more prone to be affiliated with dissimilar kinds of controversies, oekom applies an industry-specific weighing scheme to the various indicators it uses. Thus, this approach effectively leads to the generation of best-in-class sustainability ratings and scores. Additional information about the social and environmental sub-categories of indicators that oekom uses in rating companies and countries can be found in the appendix of this paper.

Oekom's international coverage of firms along with its highly sophisticated rating methodology lead to the creation of a database which is extensive and characterised by reliable and replicable quantitative measures of firm and country sustainability. These characteristics are highly desirable for conducting empirical research in the area and thus increasingly more academics have decided to make use of oekom instead of alternative CSR sources (Schreck, 2011; Sun, Nagata and Onoda, 2011). We follow this recent trend and use i) the annual numeric scores for the overall sustainability of countries and firms, ii) the scores for the social and environmental sustainability dimensions and iii) the scores for the various sub-dimensions within them<sup>5</sup> as our key independent variables. Our oekom dataset starts in 2005, ends in 2012 and comprises of 5,242

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<sup>5</sup> The social dimension is subdivided into "staff and suppliers", "society and product responsibility" and "corporate governance and business ethics" while the environmental dimension is subdivided into the "environmental management", "products and services" and "eco-efficiency".

firm-years observations for which we have numeric scores in each and every one of aforementioned categories.

We use the Thomson Reuters DealScan database (referred to as DealScan hereafter) to draw information about the characteristics of the loan contracts, the lenders and borrowers. Our proxy for the cost of bank loans is the logarithm of the spread of the loan interest rate over LIBOR, adding any annual (or facility) fee paid to the lender (or lending group) and it is measured in basis points for each dollar drawn down. Based on related previous literature on the determinants of bank loans (Fields, Fraser and Subrahmanyam, 2012; Giannetti and Yafeh, 2012; Goss and Roberts, 2011; Kim, Surroca and Tribo, 2014; Nandy and Lodh, 2012) we draw a variety of information from DealScan concerning borrowing companies to construct our set of control variables: firm size (book value of total assets), ratio of market value of equity versus book value of equity, leverage (book value of total debt over book value of total equity), profitability (return on equity), interest coverage ratio (earnings before interests and taxes over interest expenses), firm liquidity (book value of current assets over book value of current liabilities), percentage of free floating shares, financial distress (Altman's Z-score) and R&D intensity (Research & Development expenses over total sales). We additionally collect the book value of total assets as a proxy for lender size (or the average of total assets when there are a multiple lenders in a syndicated loan) and the total loan maturity (in months) from DealScan.

We also make use of the information provided by Thomson Reuters Datastream and Bloomberg to add borrower and lender credit ratings to our model specification. We use credit ratings provided by Standard and Poor's or Moody's if the former are not available and translate them to a numeric scale following a rationale similar to that applied by Ashbaugh-Skaife, Collins and LaFond (2006) and Oikonomou, Brooks and Pavelin (2014). To account for the possibility that rating agencies already include an assessment of sustainability among the extensive array of factors they consider when assigning corporate credit ratings, we regress credit scores on the respective oekom scores and use the residuals of these regressions in our main model specifications. We also calculate firm betas using stock returns and corresponding MSCI country index returns from Datastream. We use monthly data for a five year period to conduct the calculations. Lastly, in order to account for the most important economic characteristics of borrower countries<sup>6</sup>, we include real GDP growth in the years the loan facility was signed,

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<sup>6</sup> We elect to follow this process instead of using a series of binary variables for every country where a borrower is located in order to keep the model as parsimonious as possible and so that the importance of the country sustainability scores is not artificially subverted.

provided by Datastream, and binary variable taking a value of 0 when a country is classified as “Developed” by FTSE and 1 otherwise. Table I contains brief descriptions of all the above variables.

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INSERT TABLE I ABOUT HERE  
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We follow Francis, Hasan, Huang and Sharma (2012) and use loan facilities as the level of analysis thus creating a cross-section of year-loan observations<sup>7</sup>. After matching oekom with DealScan using ISINs and manual comparison of names, add credit rating information from Datastream and Bloomberg by conducting a thorough manual search, deleting double entries and excluding data points due to missing observations, we reach a final sample comprising of 470 loan-year observations in our complete model specifications. This is a sample rich in the diversity of regional characteristics as it includes borrowing firms from 28 different countries from every continent except for Africa. Furthermore, all major industries are represented. Table II provides additional details on sample characteristics by breaking down the number of observations per country, region, and industry of the borrower and year that the loan agreement was signed.

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It is worth comparing generic data coverage of this paper with those of the few previous relevant studies. In terms of corporate sustainability databases, both Goss and Roberts (2011) and Nandy and Lodh (2012) make use of KLD thus only studying the US market between 1990 and 2006. KLD is one of the most established sources of CSR data employed in empirical research though it has some important limitations: the indicators for assessing sustainability dimensions are binary (thus only indicative of presence or absence and not degree of certain characteristics) and the produced scores are not industry adjusted to reflect the key importance of different sustainability dimensions for different lines of business. Kim et al. (2014) on the other hand use Sustainalytics which allows them to create a sample covering 19 countries but for a shorter time period, namely between 2003 and 2007. Nandy and Lodh (2012) only look at the environmental component of sustainability and Kim et al. (2014) limit the analysis to business ethics. Due to the databases

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<sup>7</sup> We make this choice in order to retain a sizeable sample. This disallows us from using panel estimation techniques but as Kim et al. (2014) demonstrate, it should not make a difference to our core results regarding the effects of sustainability on cost of debt.

used, none of these studies has access to country-level sustainability scores to include in their analysis concerning likely impact on cost of bank loans. In contrast, our study uses the oekom sustainability database thus incorporating loan observations from 28 different countries across the world between 2005 and 2012 (hence also including years into the financial crisis). It looks into both the social and environmental dimensions of CSR, their components and is also the first to include country sustainability metrics within this research framework.

More quantitative information about the identity of the borrowers, lenders and loans is contained in Table III. Mean and median scores for borrowers' overall CSR scores as well as for the respective environmental and social dimensions are close to 2.1-2.2 with modest, but not trivial, standard deviations of approximately 0.4 to 0.5. It is worth noting that in the only other relevant international study (Kim et al., 2014), the variability of the sustainability (ethics) variable was low as the mean score was 70.55 and the standard deviation merely 3.65. Consequently, we believe that despite the smaller sample size, our study makes use of a rich and variable international data pool.

While there are firm-year observations for which CSR scores take the absolute minimum possible value (1), there is no single observation in the sample of a firm scoring perfectly (4) in the overall CSR, the social or the environmental dimension at any point in time. When looking at the various corporate sustainability subcategories (a1 to b3 — as described in the appendix) it is evident that they are more widely dispersed around their corresponding mean score values as they are characterised by higher standard deviations and more extreme minima and maxima. On the other hand, borrower country sustainability scores are, on average, higher compared to firm sustainability scores, ranging between 2.547 (country environmental performance) and 3.169 (country social performance) and low respective standard deviations of 0.243 and 0.298. This is unsurprising as we would expect that these sociocultural and institutional sustainability frameworks change only very slowly at the country level and thus the dynamic variability of these variables in the sample by definition is low.

In terms of financial characteristics, what stands out is that the average borrower is a profitable firm with a return on equity exceeding 24% per annum and looks to be in a good position to repay a loan as it has a relatively low leverage ratio ( $<0.3$ ) and a high interest coverage ratio (median value of 5.08). As expected for a sample of this size and variability, the average beta is very close to unity but the standard deviation of this variable exceeds 0.5, providing an array of firm-year observations with very different levels of systematic risk. The average free floating percentage is quite high ( $>76\%$ ). This is a desirable characteristic for our analysis as it allows for

market forces to have the defining role in determining corporate valuation through the analysis of financial and non-financial (including sustainability) information. Naturally, this valuation will also influence the terms of the loan agreement between lender and borrower, either through directly influencing the valuation of the collateral or by impacting the bank's opinion of the borrowing firm's financial potential. Lastly, it is worth noting that the mean value for the loan spread over LIBOR is approximately 125 basis points (1.25%)<sup>8</sup> and that the median loan maturity is 60 months (5 years).

We run all regressions at the level of loan facilities and average the values of lender-related variables<sup>9</sup> in the cases of syndicated loans. We winsorize all financial variables at the 1% level in order to avoid inferences being driven by extreme outliers and apply heteroskedasticity robust estimators. The full specification of our model makes use of all the variables we have previously mentioned and in its generic form can be written as:

$$\begin{aligned} \text{Log}(\text{Spread})_{i,t} = f(\text{Borrower}_{-}\text{Sustainability}_{i,t-1}, \text{Borrower}_{-}\text{Country}_{-}\text{Sustainability}_{i,t-1}, \\ \text{Borrower}_{-}\text{Characteristics}_{i,t-1}, \text{Lender}_{-}\text{Characteristics}_{i,t-1}, \text{Loan}_{-}\text{Characteristics}_{i,t-1}, \\ \text{Borrower}_{-}\text{Country}_{-}\text{Characteristics}_{i,t-1}, \text{Industry}_{-}\text{Effects}_i, \text{Time}_{-}\text{Effects}_i) \end{aligned} \quad (1)$$

It must be noted that to conduct all our analyses, we use different versions of firm and country sustainability metrics, starting from the overall scores, moving to the separate scores for the societal and environmental aspects of sustainability and further down to the specific components of each of these. Thus we have multiple, similar but distinct, variants of the model described in equation 1.

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 INSERT TABLE III ABOUT HERE  
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<sup>8</sup> This spread is significantly higher from Goss and Roberts (2011), Nandy and Lodh (2012) and Kim et al. (2014) where it is, respectively, 101.5, 86.5 and 79 basis points. This comes as a direct consequence of our study making use a sample which includes years of the global financial crisis where the cost of borrowing was higher.

<sup>9</sup> Unfortunately, we do not have access to the details of the contribution of each lender towards the agreed loan amounts in order to value-weight variables according to the respective percentages. Hence we use arithmetic averages instead.

## 4. Results

Table IV depicts the influence of overall country and company sustainability scores on bank loan credit spreads. In order to demonstrate the incremental explanatory power that different sets of variables have on loan spread variation, we start from a specification including solely sustainability factors and progressively move towards the full model specification. As can be seen in the first column of the table, sustainability scores can explain approximately 3% of the firm-year variation in the cost of bank loans, a small yet certainly not trivial part of the puzzle. Adding borrower characteristics increases adjusted R-squared by nearly 10% while adding lender and loan characteristics and the GDP growth rate of the borrower's country leads to a further increase of 22%. Lastly, including a series of binary variables that capture country, industry and time effects leads to a model specification which can explain almost half (48.3%) of the variation in loan spreads in our sample.

The most important finding manifesting from this set of results is that country sustainability is clearly shown to have a negative impact on the cost of bank loans, statistically significant at the 1% level, regardless of the set of control variables used. The sign, size and significance of the respective slope coefficients are remarkably stable. Hence, Hypothesis 1 receives strong support. On the other hand, Hypothesis 2 is not supported, as corporate sustainability appears to be positively connected to credit spreads, but this result becomes insignificant when including the full set of control variables in the model. In addition, the overall firm sustainability slope coefficient is consistently lower than that for country sustainability. In a nutshell, in the fully specified model, the overall country sustainability framework appears to have a significant cost-reducing effect when it comes to direct financing. More specifically, an increase in oekom country scores by one unit leads to an average decrease in bank loans spreads by 0.642% in our sample<sup>10</sup>. In contrast, the impact of a multidimensional CSR metric is not evident in our analysis. The relevant coefficient is not significant at standard confidence intervals and it is less than one third of the size of the country sustainability slope coefficient.

It is also reassuring that from the extensive array of control variables that we use, those that are shown to have a statistically significant impact on corporate loan spreads do so in the manner we

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<sup>10</sup> Because the dependent variable is log transformed, the economic significance of the slope coefficients is not immediately evident. We can easily calculate that a unit increase in country sustainability scores (which is a very significant change) leads to a reduction of loan spreads by 52% from their previous levels or approximately 64 basis points for the mean loan spread in the sample (which stands at 125 b.p. over LIBOR).

would anticipate according to basic financial theory and common sense. Firms with strong fundamentals, lower leverage, higher profitability, less indications of financial distress, higher credit ratings that borrow for shorter periods of time manage to gain access to cheaper bank loans compared to their peers with the opposite characteristics.

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INSERT TABLE IV ABOUT HERE  
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Table V zooms in on the nature of the effects of sustainability on credit costs by separately looking at the social and environmental components for both borrowing corporations and their countries. We also provide the model specifications which include only borrower characteristics to examine whether the previously noted increase in explanatory power is maintained when moving to the full specifications. Indeed, this increase is approximately 13% with an overall R-squared being in the vicinity of 50% in the case of both the social and environmental dimensions. The interest-lowering effects of country sustainability are verified and appear to be coming from both dimensions. The respective coefficients are negative and significant at the 1% level though the economic magnitude of a change in the country environmental scores on loan spreads is much larger than the impact of an equal change in the country social oekom scores: a unit increase in the environmental dimension leads to an average decrease of the cost of loan by approximately 73 basis points compared to 48 for the same increase in the social dimension. These findings are in line with our a priori expectations which led to the formation of Hypothesis 3. Also similar to previous indications is that firm level environmental sustainability appears to be unrelated to the cost of bank loans whereas societal oekom scores at the firm level are seemingly positively connected to credit spreads. Although the relevant coefficient is much lower in absolute terms compared to the ones related country sustainability (a unit increase in the social part of firm sustainability leads to an average increase of loan rates by 0.38%) and is only significant at the 10% level, the finding is still contrary to our original hypothesis. One possible interpretation comes from the works of Clarkson (1995) and especially Hillman and Keim (2001). Clarkson makes the distinction between primary and secondary stakeholders stating that it is maintaining solid strategic relationships with the former group that is crucial to ensure the financial well-being of the firm. Hence, investments targeting secondary stakeholders may be deemed to be a misappropriation of scarce corporate funds. Hillman and Keim's (2001) analysis empirically tests this conjecture as it pertains to corporate social responsibility and concludes that "using corporate resources for social issues not related to primary stakeholders may not create

value for shareholders” (p. 125). This may explain why we find a modest positive association between the social dimension of corporate sustainability and cost of debt.

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INSERT TABLE V ABOUT HERE  
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In order to further explore the key characteristics of the links between sustainability and cost of bank loans we have already identified, we make our analysis more fine-grained and use the three oekom sub-dimensions as our key independent variables. For the societal dimension, at the corporate level, these correspond to “staff and supplier”, “society and product responsibility” and “corporate governance and business ethics” while at the country level they refer to “political system and governance”, “human rights and fundamental freedoms” and “social conditions”. For the environmental dimension, the corporate level subcategories are “environmental management”, “products and services” and “eco-efficiency” whereas the country subcategories fall under “natural resources”, “climate change and energy” and “production and consumption”. The results produced by these three analyses are captured in Table VI and provide us with a very clear picture. Every sub-dimension of country sustainability is shown to be associated with lower costs of bank loans (significant at the 1% level in every case) while all aspects of corporate sustainability are found to be insignificant determinants of credit spreads — hence the findings concerning the macro-sustainability effects on loans are corroborated while the indications of a positive link between the societal part of CSR and loan interest rates can only lead to tentative conclusions. What is more, the economic importance of the environmental country sustainability factors is significantly greater than that of the respective societal ones, judging from the size of the related coefficients. A unit increase in any of the components of societal country sustainability leads to a reduction of the average credit spreads in the sample ranging between 46 and 50 basis points. The equivalent effect of environmental sub-dimensions amounts to approximately 76 or 77 basis points. Hence this segment of our investigation provides additional support for Hypotheses 1 and 3 but not for Hypothesis 2.

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INSERT TABLE VI ABOUT HERE  
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As a final set of analyses, we investigate the possible moderating role of the collapse of Lehman Brothers in the link between sustainability and loan spreads. Lehman’s bankruptcy was one of

the most crucial events within the recent global financial crisis and shifted the focus of the market “from estimates of write-downs, capital needs and merger and acquisition scenarios, to concerns about counterparty exposures and default risks”<sup>11</sup>. Becchetti, Ceniccola and Ciciretti (2010) outline the magnitude of the financial impact of the Lehman Brothers event and document that, after it occurred, investors better recognised the additional informational importance of CSR with regard to the moral character of the firm and its trustworthiness. Hence, it is possible that in the post-Lehman era, the influence of sustainability on financial contracting may have been strengthened. In order to empirically test this assertion, we include an additional binary control variable taking the value of 1 for loan facilities starting after Lehman’s filing for chapter 11 on September 15, 2008 and 0 otherwise and interaction terms between this binary variable and oekom firm scores. Although the binary variable is highly statistically significant and shows an increase in the level of corporate spreads after the event, the economic and statistical strength of the results concerning the impact of corporate sustainability on loans is extremely similar to that of our main results<sup>12</sup>.

It should be noted that the results of our study are comparable only to those of Kim, Surroca and Tribo (2014) who also perform an international examination of the impact of sustainability on the cost of bank loans. Unlike them, we do not find evidence suggesting that higher firm level sustainability reduces the cost of debt. However, we have clarified that there are two crucial differences between the two studies: i) They focus solely on the business ethics component of sustainability whereas we look into overall sustainability as well as its various components and ii) Their sample stops in 2007, right before the start of the global credit crisis which is reasonable to assume made lending institutions reconsider their policies and may have changed the corporate loan market framework. In contrast, our sample starts before the crisis, covers the entirety of its duration and finishes in 2012. In addition, both Goss and Roberts (2011) and Nandy and Lodh (2012) find that increases in overall CSR and firm environmental performance, respectively, can lead to average loan spread reductions of 7 to 20 basis points, at least in the US. Once more, the sample differences we have outlined between these studies and ours should be sufficient to reconcile the equivalent results. The fact that our study is the first to include country-level sustainability scores as possible determinants of corporate loan spreads in direct financing makes

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<sup>11</sup> Sandy Chen, analyst of Panmure Gordon and Co on Reuters: <http://www.reuters.com/article/2008/09/15/lehmanimpact-research-oppenheimer-idusbng21779220080915>

<sup>12</sup> For the sake of parsimony, we do not include the relevant results in the paper. They are available upon request.

these results impossible to compare with those manifesting from previous scholarly work. The same is true for the conclusions concerning the greater strength of the financial impact of the environmental dimension compared to that of the social dimension: Goss and Roberts (2011) use a multidimensional CSR construct whereas Nandy and Lodh (2012) focus solely on the environment and Kim et al. (2012) on ethics.

## 5. Conclusions

We conduct an international investigation on the effects of corporate and country sustainability on corporate spreads of bank loans. We look into 470 loan agreements signed between 2005 and 2012 with borrowers based on 28 different countries across the world and operating in all major industries. Our principal findings reveal that country sustainability related to both social and environmental frameworks has a statistically and economically impactful effect on direct financing. Higher country sustainability is associated with lower costs of bank loans. This conclusion is in line with the growing trend that recognizes the importance of Environmental, Social and Governance (ESG) macro-themes in the valuation of every asset class and type of financial contract<sup>13</sup>. Issues such as climate change, resource scarcity, rising and aging populations are tremendously impactful evolutions and their economic significance cannot be understated. Our analysis shows that the environmental dimension of a country's institutional framework is approximately two times as impactful as the societal dimension when it comes to determining the cost of corporate loans. The various subcategories of each dimension corroborate these findings with the environmental ones creating larger cost-reductions in bank loans compared to the societal ones. On the other hand, we find no conclusive evidence that firm-level sustainability influences the interest rates charged to borrowing firms by banks.

These results extend the academic literatures exploring i) the determinants of bank loans, ii) the empirical link between sustainability and financial performance and iii) the relationship between culture and economic behaviour. It appears that, at least in the international bank loan market, country level sustainability is priced while firm level sustainability is not, or perhaps the latter is

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<sup>13</sup> Local Government Superannuation Scheme (LGS Super) in Australia has been innovative in considering these themes and creating asset allocation strategies which incorporate them.

<http://www.lgsuper.com.au/documents/Sustainability/L0126%20Global%20Sustainable%20Bonds%20v4.pdf>

priced only through the former (which would lead to a reinterpretation of precious empirical findings). The role of trust and culture in economic decisions in agreements between contracting parties from different countries has been well documented (Botazzi, Rin and Hellmann, 2007; Licht, Siegel and Schwartz, 2011; Giannetti and Yafeh, 2012) and it provides another possible way to interpret the findings of this study. The practical importance of these findings is especially significant for regulators and sovereign governments. It is these groups that have the power to transform the entirety of the sustainability framework in their countries, thus leading to lower costs of debt for corporations, cheaper undertaking of positive net present value projects and, consequently, to higher rates of economic growth, increased employment and prosperity.

In spite of the contributions our study makes it is characterised by several limitations which provide opportunities for future research in this area. Firstly, the process by which oekom assesses firm and country sustainability characteristics leads to the creation of a single rating and corresponding score. Although this is highly useful for empiricists, there have been voices which strongly suggest that sustainability (or CSR) issues should always be distinguished into those that are related to positive and those that are related to negative social/environmental performance as these are conceptually and practically different and so are their financial outcomes (Mattingly and Berman, 2006; Lankoski, 2009). Using alternative measures for firm and country sustainability which allow for this distinction to be made may shed additional light into what exact part of sustainability is priced in the international loan markets. Secondly, our study solely focuses on the impact of sustainability on the cost of bank loans. Although this ultimately is the most important part of the loan agreement between the two parties, there may be additional loan covenants that are associated with sustainability and future research can investigate this possibility. Lastly, though our study is international it still draws data mostly from developed countries from North America and Europe. Given the increasing importance of developing countries both from an economic and a global sustainability perspective, we feel that an analysis containing more data points from this part of the world would significantly enrich our understanding of the issue at hand.

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**Table I: Definition of variables**

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Borrower oekom corp	The aggregated oekom CSR score for the borrowing firm
Borrower oekom social	The oekom corporate score for the social performance of the borrowing firm
Borrower oekom env	The oekom corporate score for the environmental performance of the borrowing firm
Borrower oekom a1	The oekom corporate score for the "staff and suppliers" sub-dimension of the borrowing firm
Borrower oekom a2	The oekom corporate score for the "society and product responsibility" sub-dimension of the borrowing firm
Borrower oekom a3	The oekom corporate score for the "corporate governance and business ethics" sub-dimension of the borrowing firm
Borrower oekom b1	The oekom corporate score for the "environmental management" sub-dimension of the borrowing firm
Borrower oekom b2	The oekom corporate score for the "products and services" sub-dimension of the borrowing firm
Borrower oekom b3	The oekom corporate score for the "eco-efficiency" sub-dimension of the borrowing firm
Borrower countryoekom	The overall oekom sustainability score for the country of the borrowing firm
Borrower countryoekom a	The oekom score for the social performance of the country of the borrowing firm
Borrower countryoekom b	The oekom score for the environmental performance of the country of the borrowing firm
Borrower rating	Numerical value of the borrowing firm's Standard & Poor's credit rating orthogonalised by the respective oekom score. When Standard and Poor's rating is not available Moody's is used instead.
Borrower beta	Systematic risk of the borrowing firm. The respective major local stock index is used as a proxy for the market.
Borrower freefloat	Borrower's percentage of free floating shares
Borrower intercover	Borrower's interest coverage ratio calculated as earnings before interests and taxes over interest expenses
Borrower mtb	Borrower's ratio of market to book value
Borrower r&d	Borrower's R&D intensity calculated as Research & Development expenses over total sales
Borrower roe	Borrower's return on equity calculated as a proxy of earnings before interests and taxes over book value of equity
Borrower ta	Borrower's book value of total assets
Borrower tdte	Borrower's leverage calculated as total debt over book value of equity

Borrower zscore	Borrower's Z-score according to Altman's original measure of financial distress
Current ratio	Borrower's liquidity calculated as book value of current assets over book value of current liabilities
Developing country	Dummy variable taking a value of 0 when a country is classified as Developed by FTSE and 1 otherwise
GDP growth	Borrower's country GDP growth rate in the year the loan facility was signed
Lender rating	Numerical value of the lender's Standard & Poor's credit rating orthogonalised by the respective oekom score. When Standard and Poor's rating is not available Moody's is used instead.
Lender ta	Lender's book value of total assets
Loan maturity	A calculation of how long (in months) the facility will be active from signing date to expiration date.
Loan spread	Describes the amount the borrower pays in basis points over LIBOR for each dollar drawn down. It adds the spread of the loan with any annual (or facility) fee paid to the bank group.

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**Table II: Borrower Sample Characteristics**

<b>Country</b>	<b>Obs.</b>	<b>Region</b>	<b>Obs.</b>
Australia	24	America (ex. USA)	15
Austria	3	Asia-Pacific	56
Bermuda	1	Europe	195
Brazil	2	USA	204
Canada	11	Total	470
China	3		
Finland	7		
France	78	<b>Industrial Classification</b>	<b>Obs.</b>
Germany	30	sic2	13
Greece	1	sic3	7
Hungary	1	sic4	195
India	4	sic5	130
Indonesia	1	sic6	36
Italy	7	sic7	38
Japan	16	sic8	10
Mexico	1	sic9	41
Netherlands	7	Total	470
Norway	2		
Poland	2		
Portugal	2		
Romania	2	<b>Loan Start Year</b>	<b>Obs.</b>
Russia	2	2006	38
South Korea	8	2007	110
Spain	13	2008	49
Sweden	5	2009	60
Switzerland	18	2010	63
UK	15	2011	110
USA	204	2012	40
Total	470	Total	470

**Table III: Descriptive statistics of key variables**

	<b>Mean</b>	<b>Median</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Std. Dev.</b>
Borrower oekom corp	2.180	2.228	3.091	1	0.363
Borrower oekom social	2.258	2.228	3.191	1	0.395
Borrower oekom env	2.093	2.139	3.378	1	0.471
Borrower oekom a1	1.803	2.081	3.750	0	1.112
Borrower oekom a2	1.720	2.065	3.270	0	1.056
Borrower oekom a3	1.947	2.151	3.905	0	1.222
Borrower oekom b1	2.039	2.572	3.692	0	1.241
Borrower oekom b2	1.462	1.733	3.675	0	0.908
Borrower oekom b3	1.575	1.600	4.000	0	1.173
Borrower countryoekom	2.858	2.950	3.379	2.518	0.243
Borrower countryoekom a	3.169	3.254	3.678	2.571	0.298
Borrower countryoekom b	2.547	2.571	3.123	2.193	0.211
Borrower ta	72908073	33331764	795000000	1491483	114000000
Borrower mtb	1.865	2.105	21.190	-126.050	7.951
Borrower tdte	0.288	0.694	5.359	-154.813	8.375
Borrower beta	0.980	0.944	3.533	-0.697	0.508
Current ratio	1.215	1.121	6.134	0.298	0.595
Borrower roe	0.245	0.256	23.098	-19.346	1.503
Borrower freefloat	76.706	85	100	10	22.563
Borrower intercover	39.322	5.085	12739.370	-27.579	589.712
Borrower r&d	0.025	0.005	0.307	0	0.0490
Borrower zscore	4.689	1.742	197.601	-5.640	17.872
Loan maturity	48.953	60	342	2	33.451
GDP growth	0.017	0.024	0.245	-0.060	0.028
Loan spread	124.987	87.500	750	2	111.861
Observations	470	470	470	470	470

**Table IV: Effect of Corporate Social Responsibility on the Cost of Bank Loans**

Table contains pooled OLS regression coefficients with t-statistics in parentheses. The logarithm of the 1% winsorised value of bank loan spread over the basis rate is the regressand. Key independent variable is total Oekom CSR score. Regressions are at the level of lender group for each loan facility and use different sets of control variables. Heteroskedasticity consistent estimators are applied. \*,\*\*,\*\*\* denote statistical significance at the 1%, 5% and 10% level respectively.

	<b>Model1</b>	<b>Model2</b>	<b>Model3</b>	<b>Model4</b>
C	5.8924 (12.617)***	4.7280 (8.867)***	4.6964 (6.871)***	5.2348 (7.362)***
Borrower oekom	0.2498 (2.540)**	0.4844 (3.829)***	0.4829 (3.307)***	0.2051 (1.327)
Borrower c.oekom	-0.6808 (-4.373)***	-0.6278 (-3.497)***	-0.6306 (-3.041)***	-0.7221 (-3.619)***
Borrower ta	-	0.0000 (4.931)***	0.0000 (3.440)***	0.0000 (0.953)
Borrower mtb	-	-0.0162 (-3.137)***	-0.0096 (-2.358)**	-0.0067 (-2.049)**
Borrower tdte	-	0.0137 (3.068)***	0.0079 (1.980)**	0.0077 (2.139)**
Borrower beta	-	0.0609 (0.642)	0.0312 (0.311)	0.0738 (0.693)
Current ratio	-	-0.1680 (-1.831)*	-0.1660 (-1.722)*	-0.1237 (-1.305)
Borrower roe	-	-0.0221 (-1.303)	-0.0091 (-0.538)	-0.0252 (-1.908)*
Borrower freefloat	-	0.0050 (2.618)***	0.0036 (1.745)*	0.0017 (0.978)
Borrower intercover	-	0.0000 (1.413)	0.0001 (1.701)*	0.0000 (0.038)
Borrower r&d	-	-0.6795 (-0.618)	-1.2479 (-1.161)	0.0632 (0.057)
Borrower zscore	-	0.0047 (1.741)*	0.0071 (3.137)***	0.0051 (2.179)**
Borrower rating	-	-0.1784 (-8.954)***	-0.1380 (-7.415)***	-0.1208 (-6.588)***
Lender ta	-	-	0.0000 (1.677)*	0.0000 (0.452)
Lender rating	-	-	-0.0675 (-1.526)	-0.0096 (-0.205)
Loan maturity	-	-	0.0027 (2.362)**	0.0038 (3.173)***
GDP growth	-	-	-4.8681 (-3.230)***	-1.8180 (-0.562)
Developing country	-	-	-	0.2803 (1.290)
Industry effects	-	-	-	YES
Time effects	-	-	-	YES
Adjusted R-squared	2.95%	12.66%	34.71%	48.32%
Observations	1007	787	478	470

**Table V: Effect of Corporate Social Responsibility Dimensions  
on the Cost of Bank Loans**

Table contains pooled OLS regression coefficients with t-statistics in parentheses. The logarithm of the 1% winsorised value of bank loan spread over the basis rate is the regressand. Key independent variable is social or environmental Oekom score. Regressions are at the level of lender group for each loan facility and use different sets of control variables. Heteroskedasticity consistent estimators are applied. \*, \*\*, \*\*\* denote statistical significance at the 1%, 5% and 10% level respectively.

<b>Oekom score</b>	<b>Social(1)</b>	<b>Social(2)</b>	<b>Env.(1)</b>	<b>Env.(2)</b>
C	3.5358 (7.894)***	4.6936 (7.080)***	6.3466 (11.347)***	6.0654 (7.829)***
Borrower oekom	0.4278 (4.565)***	0.2680 (1.905)*	0.1674 (2.276)**	-0.0318 (-0.316)
Borrower c.oekom	-0.2397 (-1.944)*	-0.4888 (-3.224)***	-1.0104 (-5.401)***	-0.8842 (-3.596)***
Borrower ta	0.0000 (4.604)***	0.0000 (0.779)	0.0000 (4.591)***	0.0000 (1.003)
Borrower mtb	-0.0178 (-2.635)***	-0.0069 (-2.134)**	-0.0174 (-2.569)**	-0.0080 (-2.599)***
Borrower tdte	0.0134 (1.974)**	0.0075 (2.133)**	0.0154 (2.279)**	0.0084 (2.423)**
Borrower beta	0.0552 (0.716)	0.0611 (0.614)	0.0180 (0.235)	0.0404 (0.393)
Current ratio	-0.0765 (-1.048)	-0.0843 (-0.963)	-0.1756 (-2.340)**	-0.1040 (-1.144)
Borrower roe	-0.0172 (-0.596)	-0.0229 (-1.730)*	-0.0256 (-0.894)	-0.0260 (-1.941)*
Borrower freefloat	0.0070 (4.674)***	0.0024 (1.345)	0.0038 (2.416)**	0.0014 (0.805)
Borrower intercover	0.0000 (0.175)	0.0000 (-0.106)	0.0000 (0.481)	0.0000 (-0.326)
Borrower r&d	-0.8141 (-0.935)	-0.2454 (-0.228)	-0.3168 (-0.369)	0.0958 (0.087)
Borrower zscore	0.0047 (2.362)**	0.0054 (2.349)**	0.0043 (2.207)**	0.0045 (2.021)**
Borrower rating	-0.1830 (-12.083)***	-0.1206 (-6.703)***	-0.1842 (-12.318)***	-0.1275 (-7.425)***
Lender ta	-	0.0000 (0.810)	-	0.0000 (0.202)
Lender rating	-	-0.0619 (-1.329)	-	-0.0358 (-0.790)
Loan maturity	-	0.0035 (3.082)***	-	0.0035 (2.948)***
GDP growth	-	-2.3513 (-0.734)	-	-1.7231 (-0.544)
Developing country	-	0.2829 (1.316)	-	0.2766 (1.289)
Industry effects	-	YES	-	YES
Time effects	-	YES	-	YES
Adjusted R-squared	35.68%	49.19%	36.67%	49.46%
Observations	588	470	588	470

**Table VI: Effect of Corporate Social Responsibility Sub-dimensions on the Cost of Bank Loans**

Table contains pooled OLS regression coefficients with t-statistics in parentheses. The logarithm of the 1% winsorised value of bank loan spread over the basis rate is the regressand. Independent variables are defined in Table I. Regressions are at the level of lender group for each loan facility. Heteroskedasticity consistent estimators are applied. \*,\*\*,\*\*\* denote statistical significance at the 1%,5% and 10% level respectively.

Key Oekom variable	A1	A2	A3	B1	B2	B3
C	4.7775 (7.931)***	4.8317 (8.093)***	4.7239 (7.629)***	6.0968 (7.839)***	6.0682 (7.736)***	6.0849 (7.776)***
Borrower oekom	-0.0119 (-0.286)	0.0643 (1.321)	0.0368 (1.062)	0.0034 (0.095)	-0.0222 (-0.470)	-0.0069 (-0.180)
Borrower c.oekom	-0.4537 (-2.946)***	-0.5094 (-3.363)***	-0.4604 (-2.912)***	-0.9525 (-4.094)***	-0.9307 (-3.930)***	-0.9413 (-3.995)***
Borrower ta	0.0000 (0.717)	0.0000 (0.293)	0.0000 (0.503)	0.0000 (0.250)	0.0000 (0.369)	0.0000 (0.316)
Borrower mtb	-0.0072 (-2.421)**	-0.0076 (-2.420)**	-0.0076 (-2.439)**	-0.0091 (-3.033)***	-0.0093 (-3.084)***	-0.0091 (-3.052)***
Borrower tdte	0.0055 (1.685)*	0.0055 (1.653)*	0.0058 (1.735)*	0.0072 (2.122)**	0.0073 (2.165)**	0.0072 (2.095)**
Borrower beta	0.0660 (0.626)	0.0770 (0.739)	0.0777 (0.745)	0.0575 (0.549)	0.0523 (0.509)	0.0528 (0.495)
Current ratio	-0.0664 (-0.731)	-0.0650 (-0.727)	-0.0701 (-0.768)	-0.0976 (-1.076)	-0.0956 (-1.053)	-0.0972 (-1.074)
Borrower roe	-0.0157 (-1.250)	-0.0131 (-1.045)	-0.0151 (-1.214)	-0.0190 (-1.496)	-0.0193 (-1.521)	-0.0190 (-1.496)
Borrower freefloat	0.0031 (1.802)*	0.0031 (1.781)*	0.0030 (1.709)*	0.0021 (1.230)	0.0022 (1.265)	0.0021 (1.222)
Borrower intercover	0.0000 (-0.864)	0.0000 (-0.664)	0.0000 (-0.748)	0.0000 (-0.278)	0.0000 (-0.349)	0.0000 (-0.320)
Borrower r&d	-0.4624 (-0.406)	-0.9729 (-0.870)	-0.7559 (-0.691)	-0.5646 (-0.513)	-0.4643 (-0.414)	-0.5018 (-0.455)
Borrower zscore	0.0051 (2.244)**	0.0048 (2.075)**	0.0049 (2.154)**	0.0046 (2.084)**	0.0046 (2.093)**	0.0047 (2.128)**
Borrower rating	-0.1195 (-6.751)***	-0.1116 (-6.386)***	-0.1144 (-6.750)***	-0.1151 (-6.789)***	-0.1171 (-6.96)***	-0.1162 (-6.854)***
Lender ta	0.0000 (0.943)	0.0000 (0.977)	0.0000 (0.998)	0.0000 (0.427)	0.0000 (0.405)	0.0000 (0.428)
Lender rating	-0.0736 (-1.502)	-0.0760 (-1.544)	-0.0739 (-1.504)	-0.0612 (-1.292)	-0.0605 (-1.286)	-0.0612 (-1.293)
Loan maturity	0.0036 (2.981)***	0.0036 (3.007)***	0.0036 (3.008)***	0.0036 (2.967)***	0.0035 (2.958)***	0.0035 (2.953)***
GDP growth	-1.88898 (-0.589)	-2.09101 (-0.652)	-2.22206 (-0.694)	-1.81393 (-0.572)	-1.72023 (-0.54)	-1.83518 (-0.579)
Developing country	0.2122 (0.94)	0.2446 (1.065)	0.2473 (1.091)	0.2607 (1.139)	0.2514 (1.103)	0.2564 (1.122)
Industry effects	YES	YES	YES	YES	YES	YES
Time effects	YES	YES	YES	YES	YES	YES
Adjusted R-squared	47.45%	47.78%	47.61%	48.48%	48.51%	48.48%
Observations	470	470	470	470	470	470

# Appendix : Oekom corporate and country rating criteria

## Oekom Corporate Rating Criteria

Oekom uses over 100 social and environmental criteria, selected specifically for each industry, and covering six areas, to assess the social and environmental performance of a company and produce the relevant corporate ratings. The six areas of assessment are:

### Social Rating

- Staff and Supplier
- Society and Product Responsibility
- Corporate Governance and Business Ethics

### Environmental Rating

- Environmental Management
- Products and Services
- Eco-Efficiency

Due to the different social and environmental challenges its industry is faced with, oekom research makes around one-third of these criteria industry-specific. All criteria are individually weighted and evaluated according to their importance before they are finally aggregated into a single score.

For more information: [http://www.oekom-research.com/index\\_en.php?content=corporate-rating](http://www.oekom-research.com/index_en.php?content=corporate-rating)

## Oekom Country Rating Criteria

Oekom uses over 100 indicators to assess the institutional framework and the performance of a country in the environmental and social area.

### **Social Rating**

Political System and Governance

- Political System
- Governance
- Corruption and Money Laundering
- Political Stability

Human Rights and Fundamental Freedoms

- Safeguarding of Civil and Political Rights
- Non-Discrimination
- Gender Equality

Social Conditions

- Health
- Education and Communication
- Labour
- Social Cohesion

### **Environmental Rating**

Natural Resources

- Land Use
- Biodiversity
- Water

Climate Change and Energy

- Climate Change
- Energy

Production and Consumption

- Agriculture
- Industry
- Transport
- Private Consumption

For more information: [http://www.oekom-research.com/index\\_en.php?content=country-rating](http://www.oekom-research.com/index_en.php?content=country-rating)