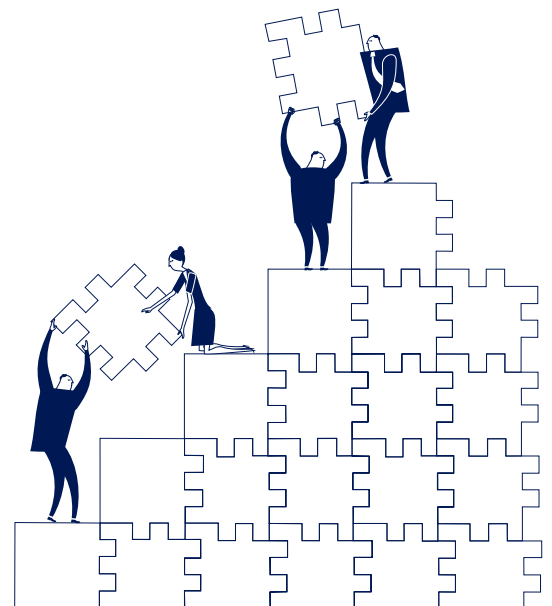

November 2017

Corporate sustainability performance and bank loan pricing: it pays to be good, but only when banks are too

Clarissa Hauptmann
Saïd Business School, University of Oxford



Saïd Business School RP 2017-20

The Saïd Business School's working paper series aims to provide early access to high-quality and rigorous academic research. Oxford Saïd's working papers reflect a commitment to excellence, and an interdisciplinary scope that is appropriate to a business school embedded in one of the world's major research universities.

This paper is authorised or co-authored by Oxford Saïd faculty. It is circulated for comment and discussion only. Contents should be considered preliminary, and are not to be quoted or reproduced without the author's permission.

Corporate sustainability performance and bank loan pricing: It pays to be good, but only when banks are too.

Clarissa Hauptmann*

Abstract

This study examines if and under which conditions corporate sustainability performance is reflected in bank loan prices. By taking the sustainability performance of the lending bank into account, I show that borrowers with strong sustainability performance pay lower loan spreads than borrowers with weak sustainability performance, however only when the lending bank exhibits strong sustainability performance. The findings hold across various methodological approaches including sample splits, interaction effects, propensity score matching, within-firm and within-bank differences and while controlling for a wide range of possible confounding effects. The setting allows for a novel analysis of differences within the same borrowers across different banks as well as banks with different borrowers. I discuss three explanatory mechanisms for the relationship: improved credit risk, increase in trust due to similarity between banks and borrowers, and reputation risk. The study reveals that the relationship between sustainability performance and loan prices is driven by a premium in loan spreads for borrowers with weak sustainability performance, rather than a spread discount for strong sustainability performance. I document that the results are not driven by measurement error or selection of borrowers to banks. Consistent with the notion that the availability of sustainability information and scrutiny have been increasing, the results of this study reveal that the relationship between borrower sustainability performance and loan pricing is stronger in more recent years.

Keywords: loan pricing, syndicated loans, sustainability, corporate social responsibility

- Preliminary draft. Please do not cite or distribute without authorization. -

Version 01.11.2017

*I am grateful for the comments and suggestions by Michael Barnett, Rob Bauer, Monique Donders, Paul Healy, Jody Grewal, Jonas Heese, Stefanie Kleimeier, Christian Leuz, Frank Moers, Sébastien Pouget, Rachel Pownall, Paulo Rodrigues, Bert Scholtens, Franziska Sump, George Serafeim, and participants at the German Finance Association Annual Meeting. I acknowledge financial support from the Ford Foundation Programme on Purposeful Ownership. Corresponding author: Clarissa Hauptmann, Saïd Business School, Oxford University, Park End St, Oxford OX1 1HP, UK. Contact email: clarissa.hauptmann@sbs.ox.ac.uk

1. Introduction

Over the recent years, waves of corporate scandals, fueled by a highly critical media, have ignited a sharp rise in consumer and investor consciousness. News on unethical working conditions and environmental pollution spread like wildfire, often resulting in serious consequences for the respective firms. Sustainability is no longer dismissed as the fuzzy concern of tree-huggers and hippies, but has become a key topic for many corporations. This is reflected in the increasing number and depth of voluntary corporate sustainability reports, but also in the rise in regulations and listings that mandate the disclosure of environmental, social, and governance (ESG) efforts (Ioannou and Serafeim, 2014). Increasingly, banks are claiming to take sustainability¹ information into account in their lending, however the empirical research remains inconclusive and with a strong focus on the borrower, while the bank as the lending counterparty is often neglected. This is surprising, considering the growing sustainability commitment of banks through internal policies or affiliations such as the Equator Principles. In early 2017 for example, HSBC Bank introduced a 'No Deforestation, No Peat, No Exploitation' policy guiding its lending policies in response to public pressures. This study examines whether banks take the sustainability performance of their borrowers into account when determining loan contract terms and uncovers the critical role of the bank's own sustainability performance in this context. Bank loans represent the most important source of financing for many companies. Therefore, a strong understanding of the underlying relationship provides insightful information on how the power of banks, as key drivers in the economy, can be leveraged to drive sustainability.

Sustainability has been identified as a source of opportunity and lever for competitive advantage. A large body of empirical research has revealed the direct effects that Corporate Social Responsibility (CSR) has on businesses, such as better access to valuable resources (Waddock and Graves, 1997), improved media coverage (Cahan et al., 2015), and more optimistic analyst assessments (Ioannou and Serafeim, 2010). Corporations with a long-term, stakeholder-oriented perspective have been more successful at attracting socially responsible consumers and shareholders (Hillman and Keim, 2001; Kapstein, 2001) and enjoy a higher reputation and attractiveness as employers (Turban and Greening, 1997). A growing stream of research has found that more socially and environmentally responsible firms are able to capture these advantages and translate them into financial outperformance (Bragdon and Marlin, 1972; Cochran and Wood, 1984; Brammer and Millington, 2008; Scholtens, 2009; Flammer, 2013; Deng et al., 2013; Eccles et al., 2014; Khan et al., 2016), which in turn has been documented to result in better access to capital (Bauer and Hann, 2010; Dhaliwal et al., 2011; Goss and Roberts, 2011; Cheng et al., 2014; Chava, 2014; Kim et al., 2014; Kleimeier and Viehs, 2016).

¹The terms sustainability and ESG are used interchangeably in this study.

In the past, the link between the shareholder equity side and ESG has been heavily studied by academics (Neubaum and Zahra, 2006; David et al., 2007; Sjöström, 2008; Glac, 2014; Grewal et al., 2017). Much however remains to be learned about the liability side. How do debt holders, in particular banks, value the sustainability efforts of their borrowers? The financial crisis of 2008 has severely damaged the reputation of financial institutions. This has forced them to invest considerable resources in rebuilding their reputation and regaining public trust. Large banks, such as Bank of America and Deutsche Bank, are now publishing detailed sustainability reports in which they emphasize their commitment to sustainability and responsible lending practices. In its 2015 sustainability report, Deutsche Bank states that it is willing to decline new business opportunities if they do not meet the ethical standards required from them: "Business initiatives with a potentially negative effect on the environment or society are subjected to painstaking scrutiny." (Deutsche Bank, 2016). Deutsche Bank emphasizes its commitment by the fact that a record high number of 1,346 transactions were screened against environmental and social benchmarks in 2015. In a similar tone, Bank of America signals its commitment by setting up a Global Corporate Social Responsibility Governance Committee in 2014 dedicated to overseeing the bank's sustainability initiatives. The overall trend is an increase in commitment to and awareness of sustainability, both in the financial and non-financial sectors.

This study begins by exploring the relationship between borrower sustainability performance and bank loan spreads regardless of bank sustainability performance. In line with some of the existing literature, I document that borrowers with strong sustainability performance have better access to capital in terms of lower loan prices (Goss and Roberts, 2011; Cheng et al., 2014; Chava, 2014; Kim et al., 2014; Cheng et al., 2015; Hasan et al., 2017; Kleimeier and Viehs, 2016). A one standard deviation improvement in borrower ESG performance results in approximately 10.95 bps or almost 10% of the average syndicated loan spread.² Based on these findings, I analyze the role of the corresponding lending banks and how their own commitment to sustainability drives this relationship. I find that borrower sustainability performance is only beneficial to borrowers, in terms of lower loan spreads, when the lending bank has high sustainability performance as well. A wide range of econometric analyses provide evidence on this, including sample splits by bank sustainability performance using seemingly unrelated regressions to compare coefficients, multivariate regression interaction effects between bank and borrower sustainability performance, propensity score matching, and within-firm and within-bank spread variations. The within-firm and within-bank tests shows that the difference in spreads is driven by high-sustainability banks penalizing low-sustainability borrowers with higher spreads, rather than by favoring high-sustainability

²Table 3 column (1) reveals a coefficient of -53.74 for borrower ESG performance on spread. A one standard deviation of borrower ESG performance is 0.20, hence $0.20 \times -53.74 = 10.95$. The average syndicated loan spread in the sample is 128.48.

borrowers with lower spreads. I document an average spread difference of 56.01 bps between borrowers with low and high sustainability performance, for the same bank with strong sustainability performance. As borrowers may select to certain banks, I control for the number of different banks that borrowers receive loans from, as a measure of access to bank loans and dependence on individual banks. The results hold also for a subsample of the top quartile most unconstrained borrowers. Furthermore, I address measurement error by using an alternative sustainability performance data source, KLD instead of Asset4 data, and additionally grouping categories into sustainability strengths and weaknesses through principal component analysis instead of using an ESG score. To further understand the underlying reasons for this finding, the time dynamics of this relationship are explored. Consistent with our expectation that sustainability has become more important over time due to both the increase in sustainability disclosures and scrutiny on banks, the results reveal that the effect is stronger in more recent years.

Summarizing, this study reveals that the relationship between strong sustainability performance and lower loan spreads is driven by banks with high sustainability performance. High sustainability performance is rewarded in terms of a reduction in penalty for borrowers. The relationship is stronger in more recent periods. I discuss that this is likely to be driven by the increase in scrutiny and reputation risk for banks, but also improved credit risk assessment and cultural similarity between banks and borrowers with similar ESG performance.

This paper contributes to the literature in several ways. To date, studies have focused on aggregate borrower sustainability performance but also individual aspects of ESG performance and how these factors mediate access to debt financing. The general notion is that sustainability performance affects loan conditions through changes in credit risk. However, considering that bank loans are contractual obligations negotiated between two parties, surprisingly little attention has been given to the role of banks in this context. This is the first study to take into account the sustainability performance of banks in the context of borrower sustainability and access to debt capital. Creditworthiness of borrowers is assessed through hard and soft information criteria which require interpretation by the corresponding bank. Consequently, assessments may be subject to biases due to certain experiences or values and differ between banks accordingly. As an example, imagine a prospective borrower that has superior sustainability performance, particularly in terms of environmental performance. A bank that values and understands the implications of environmental performance is likely to take this aspect of the borrower into account, compared to a bank that does not care or believe in value-effects of ESG on performance. Consequently, considering bank sustainability commitment is necessary in order to fully understand the underlying mechanisms. Beyond validating the relationship between sustainability performance and loan spreads, as discussed in previous literature, in this study I disentangle the relationship with the lending bank to better understand how and why firms with stronger sustainability performance attain more

favorable loan spreads on average. The findings in this study have significant practical implications, as they provide evidence on the source of price differentiation, namely in terms of a reduction in penalty for borrowers with weak sustainability performance. From a research standpoint, being able to point out the angle of spread differentiation clarifies the source of correlation and provides insights into causality. By gaining a deeper understanding of the dynamics between bank and borrower ESG performance, I help to uncover the role of financial institutions in promoting sustainability. This is extremely important as there is "much more scope for finance to promote socially and environmentally desirable activities and to discourage detrimental activities than has been acknowledged in the academic literature so far" (Scholtens, 2006). Up to now, research has been centered around the equity side and influence of shareholders on sustainability outcomes. As bank loans are one of the most important sources of capital, understanding the role of debt capital providers, particularly banks, in this context is highly important and a central contribution of this paper. My findings highlight to policy makers the importance of encouraging sustainability in the finance sector, because only banks that are thoughtful and vigilant about sustainability and related issues consider, act on, and hence are likely to promote sustainability. The former Chairman of Barclays Bank, Sir David Walker, claimed: "A successful, vibrant finance and banking sector is an essential enabler of social and economic progress, growth and development". Only with a strong understanding of the subject matter will financial institutions be able to maximize their potential as key drivers in the economy.

The remainder of the paper is set up as follows. Section 2 reviews the literature on sustainability and financial performance, access to capital, and the role of banks. Section 3 introduces the data and provides the descriptive statistics. In section 4 the methodology is discussed and empirical results are presented. Section 5 concludes.

2. Literature review and hypothesis development

The recent spike in public interest on understanding and promoting corporate sustainability performance has largely been motivated by the prospect of capturing a competitive advantage and ultimately generating financial outperformance. Consequently, most of the existing academic literature focuses on the relationship between sustainability and financial performance, primarily in terms of book- and market value of the firm. More recently, the scrutiny on the equity side has been shifted over to the liability side, revealing insightful information on the relevance of different ESG factors on access to debt capital. I begin by delivering an overview of the development of research in CSR and financial performance, followed by the more recent research on the liability side. Finally, I provide the theoretical hypothesis development.

2.1. Sustainability and financial performance

Almost 50 years have passed since Friedman (1970) first ignited the debate on corporate social responsibility with his controversial statement that the only social responsibility a firm has, is to increase its profits. In his famous New York Times article, he condemns corporate social responsibility as a misallocation of shareholder funds and suggests to separate out social goals by financing them privately. Researchers were quick to follow-up with empirical evidence: The first studies on the relationship between corporate social responsibility and firm performance were published by Bragdon and Marlin (1972) and Moskowitz (1972). Bragdon and Marlin (1972) provide initial evidence on a positive relationship between environmental sustainability and financial performance in the context of pollution control. Around the same time, Moskowitz (1972) analyzes a selection of socially responsible companies more deeply and finds that they are able to financially outperform their peers. In the decades following, academics and practitioners have struggled to understand the impact of corporate social responsibility on organizational behavior and ultimately on how it affects a firm's bottom line.

To date, most empirical findings support the notion that more sustainable firms are rewarded with higher financial performance or at least not penalized with worst performance. The literature explores different measures of sustainability - from environmental, social, and governance measures, to charitable giving, inclusion in sustainability indexes and other more aggregate proxies of sustainability. Cochran and Wood (1984) show that within different industry groups, firms with higher corporate social responsibility ratings outperform their peers financially. They use various measures for financial outperformance, including operating earnings to sales, operating earnings to assets, and excess value. Waddock and Graves (1997) postulate that corporate social performance depends on resource availability and therefore firms with higher prior financial performance outperform socially as they have the capacity to invest in social advancements. They also find that good social performance results in better future financial performance and discuss two possible mechanisms for this link. First, it may be driven by the proactive nature of sustainability which recognizes problematic domains before they become an issue. Second, engaging in social responsibility may be a tool to boost reputation, employee and shareholder relations which translate into higher financial performance. In one of the earliest comprehensive studies on sustainability and financial performance, Preston and O'Bannon (1997) discuss a range of possible causal sequences. They find no evidence for a negative correlation, but instead they find a positive relationship between social and financial performance for large US firms, in favor of stakeholder value theory. Heal (2005) discusses that CSR can improve corporate profits and reduce reputational risk. He claims that it is especially important when there are conflicts of interest. Brammer and Millington (2008) add the time dimension to the existing research and show that in the short-run, firms with low social performance outperform financially, while in the long-run

social performance pays off. Bauer et al. (2008) investigate the governance dimension and find that good corporate governance is beneficial in the Japanese setting. Guenster et al. (2011) show that there is a positive link between eco-efficiency and operating performance as well as market value. Becchetti et al. (2012) find that on average, firms that exit the Domini 400 social index suffer from negative abnormal returns, indicating that shareholders value social engagement. Flammer (2013) conducts an event study around announcements on environmental news and finds that positive news is related with a positive stock market reaction while negative news results in a drop in the share price. Using the setting of mergers and acquisitions, Deng et al. (2013) find that high CSR acquirers have better merger announcement returns, higher long-run stock performance, and achieve faster, more successful mergers. Eccles et al. (2014) show that social performance is related to better stock market and accounting performance, more non-financial disclosure, a longer-term orientation, and increased stakeholder engagement processes. Furthermore, they find that the board of directors is more likely to be responsible for sustainability, and top executive compensation is a function of sustainability metrics for firms with higher CSR performance. Serafeim (2014) summarizes that collectively his research indicates that financial performance and sustainability are not mutually exclusive: By adopting a long-term horizon, understanding the materiality of sustainability issues, regulations, societal expectations, innovation, and corporate governance it is possible to achieve financial outperformance through sustainability. Gollier and Pouget (2014) coin the term "washing machine" strategy as the method of gaining positive abnormal returns by investing in non-responsible firms and turning them more responsible. Pouget (2014) argues that positive and negative SRI screening strategies can only produce benefits when markets are not fully efficient. With active strategies, such as with the "washing machine", investors are able to produce more reliable positive financial outcomes. Similarly, Fatemi et al. (2015) show that under certain conditions, CSR expenditures can lead to shareholder value creation that can even offset the upfront costs of CSR engagement in the intermediate and long term. Krüger (2015) identifies that stock markets react negatively to positive CSR news, when agency problems persist. They react more favorably when agency problems are less likely to be present. Ferrell et al. (2016) show that firms with strong governance systems in place exhibit better sustainability performance and a better alignment of sustainability and financial performance.

Metastudies by Margolis and Walsh (2003), Orlitzky et al. (2003), Margolis et al. (2007), and more recently Friede et al. (2015) reveal that most empirical evidence indicates a positive relationship between social and financial performance, with the link being stronger for accounting-based measures than for market-based ones. A few, less recent studies oppose this relationship: Hong and Kacperczyk (2009) find that sin stocks - public companies involved in alcohol, tobacco, and gaming - financially outperform their peers. This may be driven by the fact that they are in industries with low cyclicity, resulting in more stable cash flows

especially during market downturns. Renneboog et al. (2008) discuss that SRI investors may be willing to accept sub-optimal financial performance to pursue social or ethical objectives, although they do not find a significant difference in performance. From their survey of the existing literature at the time, they conclude that the causality between CSP and CSR is not fully understood yet. Finally, Surroca and Tribó (2008) show that in the case when managers are entrenched and implement socially responsible actions, this has negative effects on financial performance.

Although it appears that most research to date supports the positive link between sustainability performance and financial performance, the underlying mechanisms have not yet been clearly established. Hence, this makes it particularly relevant to understand the transmission channels of performance and motivates research into the related field of debt financing.

2.2. Sustainability and bank loan contracting

A relationship between corporate sustainability performance and financial performance postulates that corporate sustainability performance must be fundamentally linked to the underlying cash flows of the firm. With debt contracting being highly dependent on cash flow stability and creditworthiness, this naturally motivates research on the relationship between ESG performance and bank loan financing. This is a particularly important topic considering the huge economic significance of the bank loan market in which slight changes in loan conditions can result in massive re-allocations of capital. Bhojraj and Sengupta (2003) reveal that corporate governance matters for loan conditions. They find that firms with greater institutional ownership and stronger outside board control receive lower bond yields and higher ratings due to a reduction in agency costs. Goss and Roberts (2011) find that firms with social responsibility concerns pay more on their bank debt. They discuss two opposing views. On the one hand, the risk mitigation view postulates that CSR reduces idiosyncratic risk exposure, which can translate into better creditworthiness. On the other hand, according to the overinvestment view, managers benefit from overinvestment in CSR at the expense of capital providers. In this case, good CSP does not result in better credit conditions. Their empirical results reveal that the risk reduction view outweighs, and CSR concerns have a negative impact on bank loan conditions. In other words, superior CSR performance is related to better loan conditions. Similarly, Chava (2014) who looks more specifically at environmental concerns, finds that these are related to a higher cost of debt and equity. With more lenders adopting environmentally sensitive lending policies, lenders may refuse to lend to certain firms that lack environmental responsibility, as this may pose a reputation risk for them. Other studies that focus on the environmental dimension of sustainability include Bauer and Hann (2010) and Sharfman and Fernando (2008). Bauer and Hann (2010) show that environmental concerns are associated with a significantly higher cost of debt financing and lower credit ratings. They find that proactive environmental practices are associated

with a lower cost of debt. Similarly, Sharfman and Fernando (2008) reveal that improved environmental risk is associated with a lower cost of capital, a shift from equity to debt capital, and associated tax benefits from adding debt. Kim et al. (2014) find that ethical behavior is related to better syndicated loan spreads and that the similarity in ethical domain between the borrower and bank improves loan conditions. Instead of focusing on spreads, Shi and Sun (2015) look at the number of loan covenants and find that a high CSR score is related to less bond covenants, more financial flexibility and generally less restrictions. Their results are strongest for traded bonds with potential agency problems and high bid-ask spreads. Aiming at improving our understanding of the transmission channel, Stellner et al. (2015) analyze credit risk in terms of credit ratings and z-spreads. They find that good social performance is only seen as risk-reducing when it is recognized by the environment, measured as country social performance. Finally, Cheng et al. (2015) find that higher social capital in terms of involvement in community activities on the county level is indicative of better bank loan spreads.

2.3. Theoretical hypothesis development

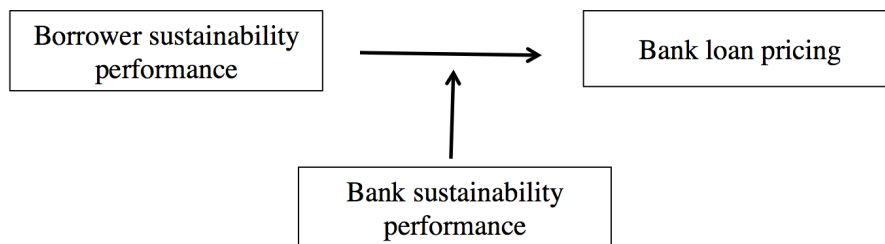
Negotiations are important in establishing loan contract terms, especially so in the syndicated loan market (Giannetti and Yafeh, 2012). Therefore, when examining loan negotiation contracts it is important to consider both parties of the transaction. This study extends the literature on the relationship between corporate sustainability performance and cost of debt by taking into account the role of the lending bank's sustainability performance. Doing so enables us to explore the channels as to why lenders value sustainability performance in their borrowers, providing valuable insights into how and when it is beneficial to engage in sustainability measures.

An increasing number of banks are claiming their heightened awareness of social responsibility in their role as financial intermediaries. This has resulted in increased voluntary reporting on sustainability efforts within firms and CSR reports are becoming common place. Currently more than 90% of the world's largest 250 corporations report on their sustainability performance (GRI, 2016). Furthermore, initiatives such as the Sustainability Accounting Standards Board (SASB), Global Reporting Initiative (GRI), Principles for Responsible Investment (PRI), and the Equator Principles have been driving the transparency and comparability of sustainability efforts. SASB, for example, has developed industry-specific sustainability reporting standards to increase transparency and comparability in reporting. Their guidelines are investor-focused and designed to channel attention to those sustainability issues that are material for the respective firm. Similarly, the GRI sets guidelines for sustainability reports to help communicate the impact that organizations have on environmental and social outcomes. Their stakeholder-oriented guidelines provide the most widely used sustainability reporting standards in the world, with more than 7,500 organizations making use

of them. From an investment management perspective, the PRI promote six main principles that encourage investors to use a voluntary set of investment principles with the objective to incorporate ESG factors into their investment practice. Currently there are more than 1,500 signatories from over 50 countries with approximately 60 trillion USD assets under management. Finally, also with the aim of promoting corporate sustainability awareness, the Equator Principles is a risk management framework specifically for financial institutions with the goal of determining, assessing and managing environmental and social risk in projects. It sets a minimum standard for due diligence in responsible risk decision-making. Over the last decade, sustainability has become central to organizations, and finance providers are beginning to understand their responsibility in providing capital in a conscientious fashion. In contrast to equity capital, bank debt generates new finance in a concentrated manner that enables stronger control and monitoring (Scholtens, 2006). Consequently, banks have a wide-reaching scope of improving sustainability in businesses. In recent years, banks are increasingly implementing screening criteria in their decision-making process and disclosing information on their sustainability initiatives in their sustainability reports, websites, and other sources of media communication.

The recent literature has revealed that superior sustainability performance not only pays off for non-financial institutions, but that banks also reap benefits. Simpson and Kohers (2002) investigate the relationship between social and financial performance for a subset of banks and find that the positive link between social and financial performance holds for them as well. Although Chih et al. (2010) do not find significant results on this relationship for a broad set of international firms from the financial industry, they do find that financial institutions engage more in CSR when competition is more intense, in order to gain a competitive advantage. Wu and Shen (2013) discuss three potential driving motives for banks to engage in CSR: Strategic choice, altruism, and greenwashing. Their results show that bank CSR performance is related to higher financial performance and less non-performing loans, indicating that strategic choice is the primary motive for banks to pursue CSR. Despite it being a strategic and not altruistic choice, Barigozzi and Tedeschi (2014) conclude that ethical banks improve welfare by implementing projects with positive externalities on society while themselves benefiting from lower default rates. Scholtens (2009) reveals that the social responsibility of banks has improved in the years 2000 to 2005 and is related to banks having become signatories to more codes of conduct, improved transparency on social responsibility, and the expansion in variety of responsible financial products. Considering that the existing literature shows that CSR affects banks operating and financing performance, it seems highly relevant to take bank sustainability into account when examining the relationship between corporate sustainability performance and access to bank debt.

I hypothesize that banks with high sustainability performance price the sustainability efforts of their borrowers into the bank loan contracts more than banks with low sustainability



- If borrower sustainability reduces **credit risk**, banks with stronger sustainability performance are better able to value this.
- **Similarity** in sustainability between banks and borrowers can increase trust between contracting parties, reduce information asymmetries, and reflect in loan spreads.
- Banks with strong sustainability performance may be exposed to **reputation risk** and hence require a reputation premium when lending to borrowers with weak sustainability performance.

Figure 1: Why does bank sustainability performance matter?

performance. I identify three main underlying mechanisms for this. First, strong sustainability performance may reduce credit risk and banks with strong sustainability performance may be better able to value this. Second, banks and borrowers with similar sustainability performance may have greater trust between each other, reducing information asymmetries and hence loan prices. Finally, banks with strong sustainability performance may care about the sustainability of their borrowers more, due to the reputation risk that they are exposed to. In this case, a borrower with sustainability concerns may affect the reputation of the lending bank. The next sections discuss these three channels in more detail.

2.3.1. Recognition of credit risk

According to the risk mitigation view by Goss and Roberts (2011), sustainability efforts reduce risk exposure and hence can improve credit risk. Supporting their reasoning, Lee and Faff (2009) show that investing in a portfolio with high CSR performing firms results in less idiosyncratic risk. Firms with high ESG performance also tend to be more long-term oriented (Eccles et al., 2014). Consequently, managers may be less tempted to boost the share price with risky, myopic actions and instead focus on long-term projects. This can result in favor to creditors, as these firms shift away from a short-term share price maximization perspective, to a longer-term profitability view. Furthermore, sustainable borrowers may be exposed to fewer legal fines e.g. due to environmental catastrophes. Such fines directly impact cash flows and are reflected in a decline in creditworthiness. Along the same lines, employee and customer relationships tend to be more stable when the motivation to work at a specific company or buy from a particular brand is not purely price-driven but rather by a socially conscious worker

or consumer (Turban and Greening, 1997; Greening and Turban, 2000). In other words, this means that both reduced consumer price elasticity as well as employee turnover improve cash flow stability and hence the creditworthiness of the firm. Furthermore, in a society of increasing consumer awareness, the media plays a significant role in communicating to stakeholders. Due to the fact that sustainability performance is positively related to media coverage (Cahan et al., 2015), this can positively influence customer loyalty and, through reduced consumer price elasticity, the firm's cash flow stability. Due to all of the above, sustainability can reduce credit risk. However, this is only reflected in the loan conditions when it is actually recognized by the lender. Stellner et al. (2015) find that in the context of country-specific sustainability, social responsibility efforts are only beneficial when they are recognized by the environment that they operate in. Similarly, bank ESG performance can be seen as a major part of the operating environment of the borrower. As Barigozzi and Tedeschi (2014) discuss, ethical banks prefer to fund projects that are more ethical, reducing loan default rates at the same time. If they are more skilled at valuing these advantages of superior ESG performance due to their own ESG performance, this will be reflected in the loan spreads.

2.3.2. Cultural similarity

The second reason as to why the advantage of borrower sustainability performance may depend on that of the lending bank is cultural similarity which can increase trust and reduce prices. When both bank and borrower have a similar attitude towards sustainability, there is a higher level of trust in the relationship. This reduces information frictions, resulting in lower loan spreads. Lewicki et al. (1998) discuss that convergent interests provide a solid foundation for trust, in terms of a positive expectation on the desired behavior. Similarly, Fulmer and Gelfand (2012) find in their review of the trust literature, that shared characteristics between two parties increase trust. This also holds true for the specific case of group membership: Williams (2001) reveals that group membership impacts the beliefs about group members' trustworthiness. The existing literature indicates that similarity in sustainability may increase trust, whether measured as convergence in interests (Lewicki et al., 1998), shared characteristics (Fulmer and Gelfand, 2012), or group membership (Williams, 2001). Building on this, a related strand of literature indicates that trust is important in the setting of bank loan contracts. Here, information asymmetries play a major role (Dennis and Mullineaux, 2000). When information asymmetries and agency problems are severe, loans contain additional and more restrictive covenants (Drucker and Puri, 2009). In their study, Ring and Van de Ven (1992) establish that trust indeed plays a central role in loan contracting. In fact, trust has been found to reduce the perceived probability of losses (Nooteboom et al., 1997). Studies to date indicate that trust and similarity may improve access to finance. Trust has been found to reduce credit constraints in SMEs (Moro and Fink, 2013).

Bottazzi et al. (2016) reveal that venture capitalists are more likely to fund entrepreneurs in countries whose citizens they trust more. Focusing on syndicated bank loans, Giannetti and Yafeh (2012) find that a higher cultural distance between borrower and lead arranging bank increases loan spreads, limits the loan size, and reduces risk sharing. Most related to this line of reasoning is the work of Kim et al. (2014). They find that loan spreads are more favorable for borrowers when bank and borrower exhibit ethical similarity, as this helps to reduce capital market frictions. When lenders and borrowers are similar, information frictions are reduced, and familiarity as well as trust in non-opportunistic behavior between the parties increases (Kim et al., 2014). This results in lower costs of formalizing transactions and reduced monitoring costs. Hence, if a smaller cultural ESG distance results in reduced information asymmetries, this could be reflected in lower bank loan spreads.

2.3.3. Reputation risk

A third channel is that banks with high sustainability performance may seek to protect their reputation from shocks that may occur through lending to irresponsible borrowers. For example, if a bank with a reputation for excellent sustainability behavior provides loans to a firm that reveals major sustainability issues, this can reflect negatively on the bank and result in a damage to its reputation. This, in turn, can lead to damages to financial performance and access to credit for the bank (Simpson and Kohers, 2002; Wu and Shen, 2013; Barigozzi and Tedeschi, 2014). Consequently, high sustainability-performing banks may require a premium to lend to low sustainability-performing borrowers to compensate for the reputation risk they face. These same banks are more willing to provide capital to borrowers with high sustainability behavior. The existing literature reveals that superior corporate social performance enhances corporate reputation (Fombrun et al., 2000). Particularly firms with a high exposure to litigation risk can be shielded by superior social performance from shocks in firm value (Koh et al., 2014) and insured from downside risk at no cost (Peloza, 2006). This is highly important for financial intermediaries, as they are only able to act as credible information producers if they have a good reputation (Chemmanur and Fulghieri, 1994). In the syndicated loan market, loans are more likely to be syndicated when the syndicate's managing agent is more reputable (Dennis and Mullineaux, 2000). Banks are highly scrutinized by the media and government regarding their social performance, due to their key role in the economy and the fact that they employ public resources paid for by society (Wu and Shen, 2013). Consequently, bank reputation may be especially sensitive to sustainability performance shocks. Therefore, banks with high sustainability performance may require a higher spread premium when lending to borrowers with low sustainability performance to offset for the reputation risk they take on.

3. Data and Sample

3.1. Sample construction

The sample is constructed by combining data from LPC DealScan, Orbis Data Solutions, Thomson Reuters Asset4, and Thomson Reuters Eikon. Detailed data on the syndicated loans is retrieved from LPC DealScan. DealScan is considered the "world's number one source for comprehensive, reliable historical deal information on the global loan markets" (Reuters, 2015). The database includes detailed loan contract terms such as the loan spread, maturity, deal size, and seniority of the loan. In addition, it provides information on the loan purpose, tranche type, and senior debt rating. Borrowing firm characteristics are gathered from Orbis Data Solutions. Orbis provides a comprehensive source of management and financial statement data on over 160 million listed and unlisted firms worldwide. It combines data from several renowned databases including Reach, Amadeus, Osiris, and Bankscope. Sustainability data is collected for both the lending banks and the borrowing firms from Thomson Reuters Asset4. Asset4 is a Swiss-based firm that uses more than 250 key performance indicators and over 750 individual data points along with their original data sources to determine the environmental, social, and governance performance of companies. These three major categories cover the key topics as follows: The environmental dimension considers resource, innovation, and emissions data. The social performance measure integrates employment quality, health and safety, but also diversity, product responsibility, and human rights. Governance is assessed by considering compensation, shareholder rights, board composition and strategy. The ESG data is collected from public sources (e.g. annual reports, sustainability reports, NGO websites) and transformed to consistent units by Asset4 analysts. Updates occur on a bi-weekly basis. Asset4 data is used by professional investors who are interested in integrating sustainability factors into their analysis. Currently, an estimate of 2.5 trillion in assets under management employ this data (Cheng et al., 2014).

The sample selection begins with the Asset4 universe of 6,140 firms and banks; going back to the first year of coverage, 2002, approximately 1000 firms are covered. This data is merged with LPC DealScan, then non-US firms and firms that do not have required financial information are removed. Only syndicated loans are included that have a single lead arranger, in order to clearly identify the lead arranging bank and relevant lender sustainability performance. The final sample covers 484 unique borrowing firms and 39 unique lending banks, resulting in 1,226 loan observations from 2002 to 2015. Table 1 provides the frequency distributions of the data. Panel A reveals the distribution across sectors and Panel B provides the distribution across years.

3.2. Descriptive Statistics

The descriptive statistics of the key variables are presented in Table 2 Panel A. The ESG performance falls within the range of 0 to 100%, where 100% represents the highest sustain-

Table 1: Frequency distributions

<i>Panel A: Industry</i>	
SIC Industry classification	N loans
1 Mining and construction	142
2 Manufacturing food, textile, lumber, publishing, chemicals, petroleum	193
3 Manufacturing plastics, leather, concrete, metal, machinery, equipment	253
4 Transportation, communications, electric, gas, sanitary services	146
5 Trade	139
6 Finance, insurance, real estate	211
7 Personal, business, and entertainment services	92
8 Professional services	50
Total	1,226

<i>Panel B: Years</i>	
Year	N loans
2002	136
2003	93
2004	124
2005	151
2006	109
2007	94
2008	114
2009	57
2010	66
2011	71
2012	68
2013	58
2014	44
2015	41
Total	1,226

Notes: The table provides an overview of the frequency distribution of loan observations included in this study by SIC major industry group of the borrowing firms in Panel A, and by year of loan syndication, in Panel B.

ability performance. The sustainability performance is available for each borrower and bank on an annual basis and is sub-divided into the subcategories environmental, social, and governance performance. The table reveals that the sustainability performance of the borrowers is on average slightly lower than that of the banks: While the mean borrower sustainability performance is 50%, that of the banks is on average higher at 75%. In all subcategories of sustainability measures, the borrower sustainability performance is on average lower than that of the banks. The standard deviation of scores however is higher for the borrowers than for the banks. This appears to be driven by the larger downside variation in borrower sustainability scores.

With regard to the borrower characteristics, firms size is measured as $\ln(\text{total assets})$ with a mean at 15.82, equivalent to 27MM. The EBIT margin is on average 0.16 with a minimum of -1.79 and maximum of 3.49. The market to book value is at 3.96%, which seems low but is driven by negative market to book ratios. Negative book ratios can occur after strings of negative earnings and this affects about 1% of our sample. Leverage is measured as total debt to assets and is on average 27.36%. Stock price volatility is at 28%. Tangibility is represented by the log of net tangible assets to total assets with its mean is at a ratio of -1.16.

The main loan characteristic of interest is the loan spread, measured by the All-in-spread drawn. This is the amount that the borrower pays over the LIBOR, including any fees. It is on average 128.48 bps and ranges from 0 to 850 bps. This is similar to the existing literature such as Goss and Roberts (2011) who find an average spread of 101 bps and Kleimeier and Viehs (2016) with 238 bps. All loans included in this sample have one lead arranger and one borrower. About 21% of the loans are secured. Number of lenders is provided in logs, on average 1.82 or approximately 9 lenders. The loan maturity is on average 38 months and ranges from 3 to 120 months. This is similar to Maskara (2010) and Lim et al. (2014) who find average maturities of 58 and 46 months, respectively. The loan tranche size is measured in logs and has a mean of 19.7. The table reveals that 45% of loans are performance priced. The covenants indicator variable reveals that the majority of the loans have covenants attached.

Panel B of Table 2 visualizes the average loan spread for different combinations of banks and borrowers in a matrix. The upper matrix splits the sample by median bank ESG performance, while the lower matrix goes further into the tails of the distribution and captures the quartiles. High borrower ESG is classified as zero if the borrower's sustainability performance is in the bottom quartile (or below median), and it is coded as one when sustainability performance is in the top quartile (or above median). Similarly, high bank ESG is zero when bank sustainability performance is in the lower quartile (or below median) and one if it is in the top quartile (or above median). A mean-difference t-test reveals the univariate difference in spreads for these combinations. The table provides a first understanding of the data and shows that banks with high ESG performance provide higher loan spreads on average to borrowers with low ESG performance. Considering the quartile-split matrix and without

Table 2: Descriptive statistics

<i>Panel A: Summary statistics</i>					
Variable	N	Mean	Std. Dev.	Min	Max
<u>ESG characteristics</u>					
Borrower ESG score	1,226	0.50	0.20	0.09	0.97
Borrower ENV score	1,226	0.37	0.28	0.09	0.97
Borrower SOC score	1,226	0.40	0.27	0.04	0.98
Borrower GOV score	1,226	0.73	0.17	0.03	0.97
Bank ESG score	1,226	0.75	0.14	0.24	0.96
Bank ENV score	1,226	0.76	0.26	0.10	0.97
Bank SOC score	1,226	0.72	0.20	0.12	0.99
Bank GOV score	1,226	0.79	0.11	0.08	0.96
<u>Borrower characteristics</u>					
Firm size	1,226	15.82	1.36	12.05	20.84
EBIT	1,226	0.16	0.21	-1.79	3.49
MTB	1,226	3.96	27.51	-157.84	901.66
Leverage	1,226	27.36	17.53	0.00	69.26
Pricevol	1,226	28.10	9.00	11.68	66.13
Tangibility	1,226	-1.16	0.75	-5.76	-0.14
<u>Loan characteristics</u>					
Spread	1,226	128.48	113.70	0.00	850.00
Secured	1,226	0.21	0.41	0.00	1.00
Numlenders	1,226	1.82	1.00	0.00	3.50
Maturity	1,226	38.54	22.44	3.00	120.00
Loansize	1,226	19.70	1.15	16.31	22.36
Perfpricing	1,226	0.45	0.50	0.00	1.00
Covenants	1,226	0.61	0.49	0.00	1.00
<i>Panel B: Bank-borrower spread matrix</i>					
Median split:	High borrower ESG	Low borrower ESG	t-statistic		
High bank ESG	121.98	160.98	4.07		
Low bank ESG	100.78	130.98	3.53		
t-statistic	2.42	3.22			
Quartile split:	High borrower ESG	Low borrower ESG	t-statistic		
High bank ESG	91.06	175.96	5.27		
Low bank ESG	83.71	146.76	1.19		
t-statistic	0.40	4.56			

Notes: The tables provide an overview of the descriptive statistics of the variables employed in this study. Panel A reveals the summary statistics. The matrix in Panel B shows the average loan spread for the respective bank-borrower ESG combinations. The t-statistic refers to the mean difference between the spread of high and low borrower ESG categories, and high and low bank ESG categories. Variable definitions can be found in appendix 16.

accounting for relevant control variables, it appears that borrowers with high sustainability performance do not receive different spreads from low vs. high sustainability banks. However, there seems to be a significant difference for borrowers with low sustainability performance.

Table 17 provides the pairwise correlations between the variables. It shows that environmental, social, governance measures are positively correlated for banks and well as for borrowers. By construction, they are correlated with the aggregate ESG measure. There does not appear to be any concern of multicollinearity between the variables based on this table.

4. Methodology and empirical results

The relationship between borrower sustainability performance and bank loan spreads is analyzed in a multivariate setting. First, the relationship between borrower sustainability performance and bank loan spreads is examined and reveals that borrowers with strong sustainability performance pay lower loan spreads on average. Then the sample is split in to two categories, depending on whether the lending bank has strong or weak sustainability performance. The previous analysis is conducted for these subgroups revealing that, in line with the hypotheses, the relationship between borrower sustainability performance and loan spreads only holds for the subgroup that borrowers from banks with strong sustainability performance. The results hold for different splits, and also for the individual ESG dimensions: Environmental, social, and governance performance. Next, this result is confirmed using interaction effects, as well as bank and borrower fixed effects to control for unobserved bank and borrower effects that do not change over time. Propensity score matching is employed and the average treatment effect on the treated is determined. Furthermore, the multivariate model is run on the matched sample. Next, within-bank and within-firm analyses are conducted to understand differences in spreads within each group, the differences are also shown for within-bank-year and within-borrower-year. Selection between banks and borrowers is addressed by controlling for borrower access to bank loans as measured by the number of different banks the borrower borrows from within the sample in absolute and relative terms. In order to address potential measurement error in sustainability information, all analyses are repeated using KLD ESG data rather than Asset4. The format of this data is also different: Instead of an ESG score, I use principal component analysis to determine the key ESG strength and weakness factors and find similar results. Finally, time dynamics are explored to determine whether the documented relationship is stronger in the more recent years with the increase in monitoring and scrutiny of banks, as well as availability of information.

In order to capture the ESG performance effect, it is necessary to control for a wide range of borrower and loan characteristics. A multivariate panel model is employed, controlling for relevant effects and clustering standard errors by the bank-borrower relationship. The

Hausman test indicates that the errors are correlated with the regressors and hence I should use a fixed effects model. In terms of borrower characteristics, firm size is controlled for and measured as the natural logarithm of total assets. Larger firms may on average receive better loan conditions, as they tend to have a longer financial history record and stronger reputation which results in more stable cash flows (Strahan, 1999). Firm performance is controlled for, measured in ROA, to account for the fact that - all else equal - more profitable firms tend to be more creditworthy. Leverage is an important determinant of creditworthiness, as the more levered a firm is, the more diluted the claim on assets. In the case of financial distress, tangible fixed assets can be liquidated to help settle outstanding claims and hence the tangibility of assets is expected to decrease loan spreads. This is most likely to be found in the tails of the distribution, when borrowers are in financial distress situations. The analysis accounts for this by including tangibility, measured as tangible assets to total assets. The loan spread is determined depending on other loan contract terms. For example, a longer loan maturity may increase the risk exposure of the bank. However, the relationship to spread can be the other way around if it is capturing the fact that more creditworthy firms receive longer maturity loans. Loan maturity is included, measured as the natural logarithm in months. Another important loan term included is the loan size. On the one hand, larger loans may reduce the syndicates diversification benefits and hence be seen as more risky. On the other hand, a larger loan size may be indicative of a higher creditworthiness of the borrower, as the bank ultimately decides on the loan amount. An indicator variable that captures whether there are any kinds of general or financial covenants attached to the loan is included. Covenants can be used as a tool to reduce agency conflicts within the lending relationship. An indicator variable for performance pricing is included. Performance pricing can help align interests and reduce agency problems with managers. However, it may be seen negatively by debt holders if it encourages excessive risk taking to achieve certain performance benchmarks. Collateral is commonly used in loan contracting to secure a loan. On the one hand, more collateral may indicate lower creditworthiness of the borrower. In contrast, a bank that decides that no collateral is needed may signal that it expects the borrower to repay the loan without issues. All else equal however, more collateral increases the probability that the loan will be repaid, even in financial distress and hence could reduce loan spreads. An indicator variable secured is used to capture this. As these are syndicated loans, the number of borrowers is considered to take into account any risk-diversification effects that may influence the loan pricing. Also included are a range of fixed effects to capture the senior debt rating of the borrower, the purpose of the loan, and type of loan. To take into account macroeconomic factors, fixed effects are included for the industry and year. Later, bank and firm fixed effects are added to account for any unobservable differences between banks or borrowers that do not vary over time.

4.1. Borrower ESG and loan spreads

The analysis begins by examining the relationship between borrower ESG performance and loan spreads. The empirical model takes on the following form:

$$\text{Spread} = f(\text{Borrower sustainability performance, firm characteristics, loan characteristics, macroeconomic controls})$$

The results are provided in Table 3. In line with the existing literature, they show that borrowers with better sustainability performance pay less on their bank loans.

Column (1) reveals that a one standard deviation improvement in ESG performance results in a decrease in loan spreads of approximately 10% of a standard deviation or 11 bps. The individual ESG dimensions are disaggregated in columns (2) to (4). The results indicate that better ESG performance in each of the individual dimensions is related to lower loan spreads. While environmental and social performance have similar economic effect sizes, borrower's governance score reveals a significantly larger magnitude. This is in line with our expectation that banks are able to value corporate governance of their borrowers better. A recent report from Allianz Global Investors summarizes the current research on ESG in the bond context. They find that "corporate governance is perceived to be the strongest credit risk contributor along the ESG dimensions" considered by rating agencies (Hörter, 2016). In line with this, in a credit policy report of Fitch Ratings they state that "poor governance practices, including country-specific and issuer-specific corporate governance matters, can result in lower ratings than typical quantitative and qualitative credit factors may otherwise imply" (Gits et al., 2015). Interpreting the control variables, our results indicate that increased leverage increases loan spreads, supporting the recognized notion that leverage increases credit risk. I also find a significant relationship between the secured indicator variable and loan spreads. The estimate shows that loans that are secured are charged higher spreads. This implies that secured loans are on average more risky, as the risk reduction from securing the loan does not outweigh the higher initial risk of these loans. I do not find a significant coefficient on loan size and hence cannot conclusively claim whether in our sample the effect of increased risk due to larger loan size or the signaling of lower risk outweighs.

Altogether, Table 3 is in accordance with the existing literature that finds that better ESG performance improves access to capital (Goss and Roberts, 2011; Chava, 2014; Kim et al., 2014; Kleimeier and Viehs, 2016; Cheng et al., 2014). In contrast to the existing empirical research however, this study neither takes on a purely high-level approach e.g. looking at aggregate concerns or strengths (Goss and Roberts, 2011), nor does it focus only on a specific factor such as environmental concerns (Chava, 2014; Kleimeier and Viehs, 2016) or ethics (Kim et al., 2014).

Table 3: Borrower sustainability performance and loan spreads

Dep.: Spread	(1)	(2)	(3)	(4)
Borrower ESG	-53.74 *** (3.00)			
Borrower ENV		-28.16 ** (2.28)		
Borrower SOC			-33.37 *** (2.63)	
Borrower GOV				-41.82 *** (2.66)
<u>Borrower characteristics</u>				
Firm size	-0.96 (0.24)	-2.04 (0.52)	-1.45 (0.35)	-3.59 (0.92)
EBIT	11.87 (0.43)	9.86 (0.36)	11.66 (0.43)	11.81 (0.43)
MTB	-0.19 ** (2.01)	-0.19 ** (2.02)	-0.19 ** (2.06)	-0.19 ** (2.02)
Leverage	0.76 *** (3.34)	0.79 *** (3.45)	0.74 *** (3.25)	0.78 *** (3.48)
Pricevol	3.92 *** (7.16)	3.86 *** (7.03)	3.87 *** (7.09)	3.95 *** (7.05)
Rating	1.90 (1.51)	2.21 * (1.74)	1.99 (1.58)	1.87 (1.48)
Tangibility	-17.36 ** (2.58)	-17.98 *** (2.70)	-18.07 *** (2.66)	-18.7 *** (2.73)
<u>Loan characteristics</u>				
Secured	42.71 *** (5.02)	43.52 *** (5.11)	43.73 *** (5.2)	42.57 *** (4.93)
Numlenders	-8.77 *** (2.62)	-9.37 *** (2.80)	-8.9 *** (2.64)	-8.5 ** (2.54)
Maturity	0.53 ** (2.21)	0.56 ** (2.32)	0.54 ** (2.27)	0.54 ** (2.23)
Loansize	-7.04 (1.45)	-7.07 (1.45)	-7.31 (1.52)	-7.38 (1.51)
Perfpricing	-12.18 * (1.76)	-11.86 * (1.71)	-12.39 * (1.79)	-13.17 * (1.87)
Covenants	1.57 (0.17)	1.68 (0.19)	1.87 (0.21)	2.99 (0.33)
<u>Fixed effects</u>				
Type	Yes	Yes	Yes	Yes
Purpose	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Constant	120.62 (1.52)	123.46 (1.55)	118.14 (1.52)	172.23 ** (2.21)
adj. R^2	0.64	0.64	0.64	0.64
N	1,226	1,226	1,226	1,226

Notes: The dependent variable is the loan spread. Column (1) reveals the relationship between the aggregate borrower ESG measure and loan conditions. Columns (2) to (4) look at the individual ESG factors of the borrower. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

4.2. Sample split into high and low ESG banks

Our hypothesis postulates that borrower sustainability performance is reflected in bank loan spreads more strongly, when the corresponding bank has high sustainability performance. To test this hypothesis, ESG scores from Asset4 are matched into the database to the appropriate lending banks. This enables us to consider both bank as well as borrower sustainability in our analysis. The multivariate regression from Table 3 is conducted for two subsamples of banks: Banks with high sustainability performance and banks with low sustainability ESG performance. The sample is split at the median sustainability performance of banks such that there are two equally sized samples.

Spread = f(Borrower sustainability performance, firm characteristics, loan characteristics, macroeconomic controls) if banks has high ESG performance vs. low ESG performance

The results are presented in Table 4. Columns (1) and (2) reveal the split results for the aggregate ESG measure. It shows that the negative relationship between borrower sustainability performance and loan spreads only holds for banks with high sustainability performance. In columns (3) to (8) the analysis for the individual categories of environmental, social, and governance performance is conducted. The finding that borrower sustainability performance only matters for banks that are in the top half of sustainability performance holds for the individual categories as well. Similar to Table 3, the results reveal the coefficient of borrower governance to be the largest negative coefficient of the ESG measures, indicating that banks consider governance to be the most highly relevant. The coefficients for the low sustainability performance banks are not only statistically insignificant on the regular confidence levels, but they are also much lower in their magnitude compared to their high-sustainability counterparts. The control variables remain fairly stable compared to the previous specification, indicating that they are not driving the results.

In untabulated tests I further split the sample into thirds and quartiles of high and low bank sustainability performance. The results hold and even are stronger in the smaller subsample analyses. In seemingly unrelated regression models based on these sample-split regressions and comparing the coefficients of borrower sustainability between the regression subsamples, the coefficients are also statistically significantly different from each other across samples. Furthermore, in untabulated tests CDS spreads are controlled for in addition to already controlling for credit rating, to more closely determine whether sustainability performance is related to credit worthiness. The sample split results hold also controlling for CDS spreads. Given the multitude of controls for credit risk, this is indicative that the mechanism may be one other than credit risk.

Table 4: Split by bank sustainability performance

Dep.: Spread	Bank ESG		Bank ENV		Bank SOC		Bank GOV	
	Low (1)	High (2)	Low (3)	High (4)	Low (5)	High (6)	Low (7)	High (8)
Borrower ESG	-22.39 (1.07)	-91.54*** (3.38)						
Borrower ENV			-23.49 (1.59)	-38.72* (1.93)				
Borrower SOC					-0.53 (0.03)	-58.09*** (3.31)		
Borrower GOV							-32.08 (1.27)	-60.01*** (3.03)
<u>Borrower characteristics</u>								
Firm size	-10.17** (2.00)	1.09 (0.22)	-5.28 (1.12)	-7.27 (1.33)	-18.2*** (3.41)	8.60* (1.77)	-11.45** (1.99)	-0.82 (0.16)
EBIT	-45.89* (1.79)	32.33 (1.32)	-62.73*** (2.62)	28.96 (1.13)	-25.3 (0.54)	34.39 (1.24)	58.21** (2.21)	-34.52 (0.95)
MTB	-1.22** (2.58)	-0.09 (1.29)	-0.19*** (3.35)	-1.00** (2.55)	-1.82*** (2.75)	-0.08 (1.15)	-2.35* (1.74)	-0.03 (0.55)
Leverage	0.44 (1.54)	0.63* (1.93)	0.87*** (3.38)	0.66* (1.89)	0.47 (1.29)	0.88*** (3.29)	0.58* (1.92)	1.05*** (3.52)
Pricevol	3.42*** (5.38)	4.12*** (5.91)	3.88*** (5.22)	3.49*** (4.95)	3.61*** (5.37)	4.04*** (5.86)	4.17*** (5.85)	3.96*** (5.66)
Rating	2.24 (1.31)	1.17 (0.67)	2.14 (1.26)	0.26 (0.15)	0.99 (0.52)	1.57 (0.91)	-0.38 (0.22)	1.45 (0.82)
Tangibility	-39.06*** (3.80)	-12.97 (1.49)	-21.36*** (3.06)	-17.56* (1.83)	-46.65*** (4.79)	2.23 (0.28)	-34.61*** (3.51)	-2.67 (0.34)
<u>Loan characteristics</u>								
Secured	39.65*** (3.60)	42.33*** (3.31)	47.07*** (4.00)	43.91*** (3.28)	40.05*** (3.50)	42.19*** (3.49)	45.36*** (3.90)	37.04*** (2.65)
Numlenders	-10.64** (2.05)	-6.31 (1.28)	-10.31** (2.37)	-8.46 (1.64)	-7.69 (1.43)	-9.83** (2.10)	-10.51* (1.89)	-6.29 (1.47)
Maturity	0.15 (0.55)	0.88** (2.47)	0.48* (1.70)	0.64* (1.80)	-0.02 (0.08)	1.16*** (3.55)	0.37 (1.20)	0.50 (1.55)
Loansize	3.57 (0.80)	-9.50 (1.46)	1.69 (0.32)	-10.39* (1.70)	3.24 (0.71)	-16.32** (2.36)	-2.56 (0.55)	-10.78* (1.73)
Perpricing	-13.06 (1.20)	-20.12** (2.09)	-3.01 (0.27)	-21.34** (2.31)	-19.75* (1.81)	-13.52 (1.56)	-2.00 (0.22)	-20.66* (1.74)
Covenants	10.21 (0.87)	-1.96 (0.15)	3.15 (0.28)	-1.73 (0.13)	18.67 (1.59)	-6.27 (0.45)	1.83 (0.17)	5.64 (0.38)
<u>Fixed effects</u>								
Type	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Purpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	137.11 (1.50)	142.01 (1.31)	-7.61 (0.09)	300.31*** (2.62)	209.65** (2.00)	160.33 (1.49)	162.8* (1.94)	248.81** (2.39)
adj. R^2	0.71	0.66	0.69	0.67	0.71	0.66	0.72	0.63
N	613	613	613	613	613	613	613	613

Notes: The dependent variable is the loan spread. Columns (1) and (2) reveal the relationship between borrower ESG and loan conditions after splitting observations by the median Bank ESG performance. Columns (3) and (4) consider environmental performance, (5) and (6) social performance, (7) and (8) governance. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

4.3. Interaction effects

In the next step, an interaction effect is constructed between bank and borrower sustainability performance to capture the relationship more precisely. The results are provided in Table 5. When both bank and borrower sustainability performance are higher, loans spreads are lower. In column (1) the result is shown for the aggregate ESG measure. In columns (2) to (4) the individual sustainability measures are investigated separately. The table reveals that all three factors - environmental, social, and governance performance - interacted with the respective bank dimension load negatively and significantly. This supports our previous findings that borrower sustainability performance reduces loan spreads especially when bank sustainability performance is high. The positive level effect of borrower sustainability performance reveals that this is otherwise not the case.

As an additional robustness exercise, bank and firm fixed effects are included to control for any unobservable differences between banks and between firms that do not change over time and are not absorbed by our existing control variables. The results are shown in Table 6. There is no evidence that the results are additionally driven by fixed effects as our coefficients are similar to the previous model including firm and loan controls. The high adjusted R-squared of almost 70% indicates that our models have a strong predictive power in explaining the variation in syndicated loan spreads.

For additional robustness all previous analyses are conducted on a sample that excludes financial and utility companies in untabulated tests, although industry fixed effects are controlled for in the models. The literature often excludes firms in these categories, as they are considered to be quite different to other industries and may have different cash flow risk exposures. For this study, the results are robust to the exclusion of such firms.

4.4. Within firm and within bank spread changes

To ensure that our multivariate results using panel data are not driven by cross-sectional variation but that these results can also be recorded within firms and banks, differences in spreads for borrowing firms that borrow from different banks and analyze spreads of banks that lend to different borrowers are analyzed. The results are shown in Table 7. In Panel A, the focus is on borrowing firms that borrow from banks with different levels of sustainability performance. According to our hypothesis, borrower sustainability performance should vary when borrowing from a bank with high sustainability performance, as these banks price the information. Therefore the sample splits the borrowers into borrowers with low sustainability performance and borrowers with high sustainability performance, where the cut-off point is determined at the 25% level. The results reveal that low ESG borrowers receive better loan spreads from low sustainability banks, than from high sustainability banks. The difference is on average 64 bps for the aggregate ESG measure. These differences can also be found in the subcategories, especially for environmental performance but also for social performance. For

Table 5: Interaction effects

Dep.: Spread	(1)	(2)	(3)	(4)
Borrower score	125.92 ** (2.00)	77.40 * (1.84)	25.24 (0.84)	125.62 ** (2.24)
Bank score	116.13 ** (2.40)	22.27 * (1.88)	23.36 (1.00)	163.04 *** (2.93)
Bank × Borrower ESG	-234.13 *** (2.77)			
Bank × Borrower ENV		-136.90 ** (2.50)		
Bank × Borrower SOC			-81.15 * (1.87)	
Bank × Borrower GOV				-225.01 *** (2.98)
<u>Borrower characteristics</u>				
Firm size	-1.17 (0.30)	-1.89 (0.48)	-1.22 (0.30)	-3.78 (1.00)
EBIT	13.00 (0.48)	9.98 (0.36)	12.39 (0.45)	12.50 (0.46)
MTB	-0.19 ** (1.99)	-0.18 ** (2.02)	-0.19 ** (2.02)	-0.19 ** (1.99)
Leverage	0.75 *** (3.30)	0.77 *** (3.38)	0.75 *** (3.31)	0.77 *** (3.41)
Pricevol	3.86 *** (7.20)	3.86 *** (7.14)	3.83 *** (7.21)	3.96 *** (7.10)
Rating	1.81 (1.44)	2.02 (1.61)	1.80 (1.43)	1.52 (1.20)
Tangibility	-17.41 *** (2.62)	-18.25 *** (2.80)	-17.88 *** (2.65)	-18.56 *** (2.71)
<u>Loan characteristics</u>				
Secured	43.5 *** (5.07)	44.12 *** (5.15)	44.34 *** (5.22)	42.96 *** (4.96)
Numlenders	-8.69 ** (2.57)	-9.47 *** (2.84)	-9.06 *** (2.69)	-8.37 ** (2.49)
Maturity	0.53 ** (2.26)	0.57 ** (2.38)	0.54 ** (2.32)	0.56 ** (2.33)
Loansize	-6.90 (1.45)	-7.02 (1.44)	-7.47 (1.57)	-7.25 (1.48)
Perfpricing	-13.02 * (1.88)	-12.09 * (1.74)	-13.28 * (1.92)	-13.90 * (1.96)
Covenants	2.09 (0.23)	1.14 (0.13)	2.81 (0.32)	4.55 (0.49)
<u>Fixed effects</u>				
Type	Yes	Yes	Yes	Yes
Purpose	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Constant	33.82 (0.43)	103.5 (1.30)	93.16 (1.22)	53.94 (0.62)
adj. R^2	0.64	0.64	0.64	0.64
N	1,226	1,226	1,226	1,226

Notes: The dependent variable is the loan spread. Column (1) reveals the relationship between borrower ESG and loan conditions including an interaction effect by Bank ESG performance. Columns (2) to (4) consider environmental performance, social, and governance performance. Borrower score and bank score are the respective baseline variables of the interactions. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

Table 6: Bank and firm fixed effects

Dep.: Spread	(1)	(2)	(3)	(4)
Borrower score	124.74 ** (2.03)	72.06 * (1.74)	26.60 (0.89)	124.22 ** (2.22)
Bank score	123.69 ** (2.48)	24.61 ** (2.02)	30.31 (1.15)	168.61 *** (3.05)
Bank × Borrower ESG	-231.1 *** (2.82)			
Bank × Borrower ENV		-129.39 ** (2.42)		
Bank × Borrower SOC			-82.14 * (1.91)	
Bank × Borrower GOV				-220.66 *** (2.95)
<u>Borrower characteristics</u>				
Firm size	-1.26 (0.32)	-1.95 (0.49)	-1.43 (0.35)	-3.84 (1.00)
EBIT	13.81 (0.51)	10.76 (0.39)	13.04 (0.48)	13.25 (0.49)
MTB	-0.19 ** (2.02)	-0.19 ** (2.04)	-0.2 ** (2.10)	-0.19 ** (2.02)
Leverage	0.77 *** (3.40)	0.79 *** (3.47)	0.77 *** (3.37)	0.79 *** (3.52)
Pricevol	3.93 *** (7.34)	3.94 *** (7.27)	3.93 *** (7.34)	4.02 *** (7.23)
Rating	1.66 (1.33)	1.86 (1.50)	1.76 (1.40)	1.39 (1.11)
Tangibility	-16.9 ** (2.57)	-17.75 *** (2.74)	-17.63 *** (2.64)	-18.06 *** (2.66)
<u>Loan characteristics</u>				
Secured	43.52 *** (5.00)	43.95 *** (5.06)	43.23 *** (5.09)	43.01 *** (4.90)
Numlenders	-9.02 *** (2.69)	-9.79 *** (2.95)	-9.19 *** (2.70)	-8.71 *** (2.61)
Maturity	0.54 ** (2.33)	0.58 ** (2.44)	0.55 ** (2.37)	0.57 ** (2.39)
Loansize	-6.69 (1.38)	-6.76 (1.37)	-7.06 (1.46)	-7.03 (1.41)
Perfpricing	-12.64 * (1.80)	-11.71 * (1.67)	-12.78 * (1.82)	-13.49 * (1.89)
Covenants	2.00 (0.22)	1.08 (0.12)	2.44 (0.27)	4.41 (0.48)
<u>Fixed effects</u>				
Type	Yes	Yes	Yes	Yes
Purpose	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
Bank	Yes	Yes	Yes	Yes
Constant	20.13 (0.25)	95.37 (1.20)	88.6 (1.15)	40.81 (0.48)
adj. R^2	0.65	0.64	0.64	0.68
N	1,226	1,226	1,226	1,226

Notes: The dependent variable is the loan spread. Column (1) reveals the relationship between borrower ESG and loan conditions including an interaction effect by Bank ESG performance. Columns (2) to (4) consider environmental performance, social, and governance performance. Borrower score and bank score are the respective baseline variables of the interactions. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

governance, there is slight evidence that well governed borrowers receive better loan spreads from well governed banks. Altogether, the within-firm analysis however indicates that the difference is largely driven by weak sustainability borrowers, rather than strong performers in sustainability. This supports the notion of a premium for bad behavior, rather than a discount for good behavior.

Panel B considers within-bank differences in loan spreads for banks that lend to borrowers that have different levels of sustainability performance. The split is in accordance with Panel A. For the aggregate ESG measure, banks with high ESG performance provide different loan spreads to borrowers depending on their sustainability performance. The average difference is 56 bps, which is similar to the differences documented in Panel A that borrowers experience depending on the different banks that they receive credit from. Observing the loan spread differences for the subcategories of ESG performance, for environmental sustainability, both banks with high and low distinguish between their borrowers sustainability performance. However, in terms of magnitude, the banks with high environmental performance provide 80 bps difference in spreads while low environmental banks provide only 21 bps difference and only at the 10% significance level. For social and governance performance of banks, only banks with high sustainability performance take these factors into account when pricing loans.

The results in this table provide evidence that sustainability performance is only priced by banks with high performance. More specifically, this table shows us that the variation in spreads is driven by a downside premium, rather than an upside discount for borrowers that are considered more sustainable. In an open market, banks are in competition to retain customers and lending relationships. Increasing loan spreads may result in a loss of business and should therefore be considered with caution. Why do borrowers with low sustainability performance take loans from banks with high sustainability performance? As this is the first study to examine and document this effect, it is possible that the respective borrowers are not aware of the counterfactual situation, had they turned to a less sustainable bank. Another explanation is that banks with strong ESG performance tend to be larger and hence easier accessible. If the cost of reaching out to a smaller, less accessible bank is higher than the additional spread charge, this is an economically sound reason to borrower from a bank with strong sustainability performance as a low-sustainability borrower. Similarly, if lending relationships have persisted and switching costs are high, borrowers may prefer to remain with the bank. In the case of the later two arguments, the important role of banks in fostering sustainability is apparent, as borrowers that do not want to or cannot switch will benefit from strengthening their sustainability performance.

Table 8 shows how the relationship evolves over different deciles of borrower sustainability performance. The table provides the mean spread for loans from high vs. low ESG banks split at the median. The last column shows the difference in spreads. Borrower ESG

Table 7: Within firm and bank spread changes

Panel A: Firm perspective

Borrower	Bank	Within firm						Within firm-year				
		N	Mean	Stdev	Diff.	t-stat	N	Mean	Stdev	Diff.	t-stat	
Low ESG:	Low ESG	88	102.35	86.73	-63.62 ***	3.28	11	98.23	68.72	-88.21	1.26	
	High ESG	56	165.96	146.34			15	186.43	224.31			
High ESG:	Low ESG	65	75.92	82.32	7.16	0.66	14	84.11	65.06	-5.32	0.19	
	High ESG	91	68.76	53.92			13	89.42	77.18			
Low ENV:	Low ENV	89	102.86	94.05	-174.29 ***	5.38	14	95.11	75.08	-98.32	1.51	
	High ENV	19	277.15	231.47			14	193.43	232.25			
High ENV:	Low ENV	67	77.06	83.32	-7.10	0.46	14	94.82	72.57	17.55	0.69	
	High ENV	37	84.16	56.08			11	77.27	48.66			
Low SOC:	Low SOC	105	126.01	91.73	-44.65 **	2.53	10	94.30	72.58	-83.76	-1.17	
	High SOC	76	170.66	145.33			16	178.06	217.63			
High SOC:	Low SOC	84	99.98	102.37	10.02	0.69	14	99.46	85.53	20.04	0.71	
	High SOC	102	89.96	95.94			13	79.42	56.96			
Low GOV:	Low GOV	142	155.72	137.09	20.29	1.15	11	100.27	67.97	-83.33	1.19	
	High GOV	94	135.43	124.53			15	183.60	224.17			
High GOV:	Low GOV	112	127.29	109.79	23.95 *	1.55	14	70.71	42.57	-34.67	1.26	
	High GOV	110	103.34	101.93			13	105.38	93.43			

Panel B: Bank perspective

Bank	Borrower	Within bank					Within bank-year				
		N	Mean	Stdev	Diff.	t-stat	N	Mean	Stdev	Diff.	t-stat
Low ESG:	Low ESG	331	97.61	80.01	15.65	1.47	187	92.56	76.67	8.74	1.01
	High ESG	72	81.97	89.62			134	83.82	76.36		
High ESG:	Low ESG	274	148.72	114.94	56.01 ***	4.98	454	156.91	122.96	139.13 ***	4.99
	High ESG	129	92.70	81.14			330	114.68	107.88		
Low ENV:	Low ENV	121	111.31	88.40	21.72 *	1.66	232	101.59	90.59	9.51	0.94
	High ENV	81	89.59	94.15			116	92.08	85.61		
High ENV:	Low ENV	102	200.52	132.56	80.85 ***	5.15	472	146.61	123.98	25.74 ***	2.93
	High ENV	125	119.67	103.84			282	120.87	103.03		
Low SOC:	Low SOC	92	129.73	94.37	18.96	1.21	236	142.84	115.78	22.34 *	1.95
	High SOC	87	110.77	114.77			168	120.49	109.94		
High SOC:	Low SOC	105	156.47	127.25	67.01 ***	4.35	399	136.54	113.71	39.89 ***	4.91
	High SOC	106	89.46	94.20			302	96.65	96.08		
Low GOV:	Low GOV	305	135.44	124.94	21.11	1.49	238	134.59	117.47	13.32	1.26
	High GOV	98	114.33	111.81			293	121.27	123.80		
High GOV:	Low GOV	295	120.51	108.07	20.66 *	1.73	241	137.43	96.81	26.51 ***	3.17
	High GOV	108	99.85	99.89			333	110.92	100.36		

Notes: The table provides the mean difference of spreads for within firm changes of bank in Panel A, and within bank changes of firms in Panel B. More specifically, Panel A provides the average spread for firms that borrow from banks with different ESG scores and uses a mean difference t-test to compare the spreads in both groups. Similarly, Panel B encompasses banks that have borrowers with different ESG scores and compares the average spreads that these borrowers receive in each group. The "within firm" columns split the sample at the 25th and 75th percentile, while the "within firm-year" columns split the sample at the median to retain observations. Untabulated tests reveal that splitting the "within firm-year" samples at the 25th and 75th percentiles produces stronger difference estimate for the low ESG borrowers and high ESG banks as predicted although not significant due to the low sample size. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

Table 8: Average spread over sustainability deciles

	Low bank ESG (I)	High bank ESG (II)	Difference (I) - (II)
Borrower ESG decile 1	159.65	175.18	15.53
Borrower ESG decile 2	154.38	188.88	34.50
Borrower ESG decile 3	112.69	155.17	42.48
Borrower ESG decile 4	102.91	157.47	54.56
Borrower ESG decile 5	120.21	132.47	12.26
Borrower ESG decile 6	100.62	170.81	70.19
Borrower ESG decile 7	93.32	125.28	31.96
Borrower ESG decile 8	111.95	120.61	8.66
Borrower ESG decile 9	105.05	114.63	9.58
Borrower ESG decile 10	91.98	94.57	2.59

Notes: The table provides the mean spread for banks with high vs. low sustainability performance for ten deciles of borrower sustainability performance, showing how differences in spread change depending on borrower sustainability levels.

decile 1 encompasses the loans with the lowest sustainability performance of borrowers, while Borrower ESG decile 10 includes borrowers with the top 10% of sustainability performance. Eyeballing the table reveals that borrowers in the most sustainable decile receive the lowest loan spreads. However, the difference in loan spreads is more pronounced for the sample of high ESG banks. Our findings seem to be driven by the earlier deciles of borrowers, indicating that particularly when borrowers are considered less sustainable, the difference in spreads depending on the type of bank is large.

Finally, the multivariate regression is repeated on the sample of banks and borrowers that lend to both high and low ESG borrowers and borrow from banks with high and low ESG performance, respectively. The results are shown in table 9. Column (1) incorporates the sample of borrowers with low ESG performance that borrow from banks with different levels of ESG performance. A spread difference of 67.57 bps is documented. Column (2) shows the results for the sample of borrowers with high ESG performance which also borrow from banks with different levels of ESG performance. In accordance with the expectations, there are no differences in loan spreads depending on bank ESG performance. In columns (3) and (4) the results are shown for the bank samples, where column (3) comprises banks with low ESG performance and column (4) banks with high ESG performance. Within the sample of banks that lend to different types of borrowers, the result only holds for banks with high ESG performance and borrowers with low ESG performance. This setting allows us to ensure a

Table 9: Multivariate regressions on within change sample

Dep.: Spread	(1)	(2)	(3)	(4)
Bank ESG (dummy)	67.57*** (2.89)	-22.07 (-1.51)		
Borrower ESG (dummy)			3.14 (0.25)	-32.97*** (-2.67)
<u>Firm characteristics</u>				
Firm size	-5.37 (-0.40)	15.78 (1.49)	-13.37** (-2.46)	4.85 (0.76)
EBIT	-60.49 (-0.67)	-122.77 (-1.58)	-50.83* (-1.79)	-11.83 (-0.36)
MTB	-1.43 (-1.21)	0.14 (0.08)	-1.03*** (-3.42)	-0.16 (-0.23)
Leverage	0.92 (1.01)	0.30 (0.64)	-0.01 (-0.04)	0.71* (1.78)
Pricevol	6.12*** (2.93)	2.02 (1.48)	2.86*** (3.86)	3.04*** (3.53)
Rating	6.22 (1.29)	6.26** (2.45)	2.10 (1.12)	5.35** (2.21)
Tangibility	-8.70 (-0.41)	-11.09 (-0.69)	-31.66*** (-3.44)	1.32 (0.12)
<u>Loan characteristics</u>				
Secured	90.33*** (3.67)	61.30 (1.42)	47.89*** (3.98)	36.86* (1.85)
Numlenders	-23.79 (-1.58)	12.95** (2.23)	-8.65 (-1.58)	-7.45 (-1.14)
Maturity	1.28* (1.71)	0.09 (0.27)	-0.39 (-1.33)	1.22*** (3.18)
Loan size	-17.58 (-1.36)	-7.45 (-1.28)	7.57 (1.59)	-14.64** (-2.02)
Perfpricing	27.16 (0.91)	3.24 (0.19)	-11.03 (-0.72)	-17.45 (-1.24)
Covenants	-26.43 (-0.81)	8.11 (0.42)	-1.01 (-0.06)	-11.04 (-0.59)
<u>Fixed effects</u>				
Loan purpose FE	Yes	Yes	Yes	Yes
Loan type FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Constant	165.17 (0.68)	-260.37 (-1.43)	168.99* (1.67)	197.61 (1.54)
N	144	156	403	403
Adj. R^2	0.66	0.65	0.59	0.54

Notes: The table provides the results for the multivariate regression based on within-firm and within-bank differences in bank ESG and borrower ESG, respectively. Column (1) comprises borrowers with low ESG performance that borrower from both high and low ESG banks. Column (2) comprises high ESG borrowers that borrower from both high and low ESG banks. Column (3) shows the results for the sample of low ESG banks that lend to both high and low ESG borrowers. Finally, column (4) shows the results for the sample of high ESG banks that lend to both high and low ESG borrowers.

robust documentation of the findings by reducing any effects of correlated omitted variables.

4.5. Selection

A natural concern is whether the results are driven by matching between banks and borrowers. First, the characteristics between borrowers that borrow from banks with strong ESG performance vs. those with weak ESG performance may differ. We address this in the next subsection. Second, borrowers may switch to banks that are more favorable to them. This gives rise to the question whether the results are driven by borrowers that are constrained in their banking relationships, as unconstrained borrowers could switch to banks that provide cheaper loans. This is addressed in the second subsection.

4.5.1. Propensity Score Matching

If strong ESG borrowers are generally more creditworthy and strong ESG banks lend to them more than to other borrowers, then we may be capturing this effect. To visualize this concern, figure 2 shows the distribution of borrower ESG scores for banks in the upper and lower half of ESG bank performance. The distribution for banks with high ESG performance is more platykurtic compared to that of the banks with lower ESG performance, however their mean and median values appear to be similar. I address the matching concern by first investigating differences in variables for the sample of borrowers that borrow from high vs. low ESG banks.³ I then use propensity score matching to, in the first step, estimate the probability that a borrower selects into a high or low ESG bank or borrower, and in the second step, use the estimated propensity to compute the average treatment effect on the syndicated loan spread for the matrix of four possible bank-borrower combinations. In accordance with our findings indicating that the difference is driven by a penalty for borrowers with low sustainability performance, the subsets of low ESG borrowers and high ESG banks are of particular interest to us.

The results of the first stage probit are shown in Table 10. Borrower-specific control variables from the multivariate regression models are used to estimate the probability that the corresponding bank is of high or low sustainability. The probit model regresses the high-ESG-bank instrument on size, EBIT, MTB, Leverage, Pricevol, Rating, and Tangibility. For the sample A of low ESG borrowers, larger and more price-volatile borrowers borrow from high ESG banks. For the sample B of high ESG borrowers they tend to be more levered when the bank has high ESG performance. Samples C and D provide the probit models for the samples of high and low ESG banks, respectively.

³A simple mean difference t-test between borrowers that borrow from high vs. low ESG banks reveals differences in stock price volatility, but most other covariates do not differ between the two groups. The results of the mean difference between high and low ESG banks for the firm characteristics can be found in appendix Table 18.

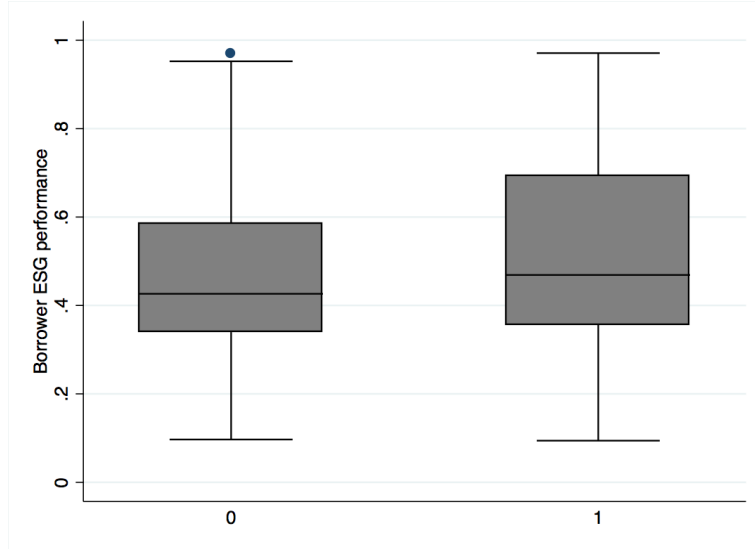


Figure 2: Borrower sustainability performance for banks with high and low ESG

In the second step, the difference in loan spread is computed for observations of the treated compared to the untreated group that have similar propensity scores. Table 11 shows the average treatment effect of the treated group for each sample. The results are in line with our previous findings, indicating that borrowers with low sustainability scores receive higher loan spreads when borrowing from a bank that has high sustainability performance. In terms of magnitude, the average treatment effect for borrowers with low ESG performance borrowing from high ESG banks is 81 to 90 bps in difference, as shown in Table 11 in samples A and C. Using the same propensity score matching procedure, the average treatment effect for borrowers with high sustainability scores is not significant, as seen for sample B, or banks with low sustainability performance, as seen for sample D.

Next, the multivariate regression from the previous section on the propensity score matched sample is run. The results are provided in Table 12. Similar results for the propensity score matched samples are documented as in the multivariate models with sample splits and interaction effects. For the sample of low ESG borrowers, sample A, the table reveals that these borrowers receive rates that are 63.15 bps higher, while this is not the case for high ESG borrowers, shown in sample B. Similarly, for the sample of high ESG banks, in sample C, borrowers with high ESG performance pay lower spreads of 58.85 bps, after controlling for other possible confounding variables. This does not hold for sample D which comprises low ESG banks.

4.5.2. Constrained borrowers

In the case that borrowers are constrained in their borrowing and highly dependent on a bank, the bank may be able to take advantage of this in the loan pricing. This could

Table 10: Propensity Score Matching - Probit

Dep. Var.	Low-high ESG bank (A)	Low-high ESG bank (B)	Low-high ESG borrower (C)	Low-high ESG borrower (D)
Firm size	0.24 *	0.07	0.37 ***	0.72 ***
	1.92	0.73	3.40	4.61
EBIT	-0.63	1.05	-0.18	-2.89 ***
	-1.10	1.20	-0.40	-3.09
MTB	-0.02	0.00	0.01	0.09 ***
	-1.56	-0.02	1.10	2.86
Leverage	0.01	0.03 **	0.00	-0.01
	0.78	2.32	-0.34	-0.62
Pricevol	0.07 ***	0.00	-0.03 **	0.01
	4.77	0.02	-2.29	0.34
Rating	0.08	0.03	-0.07	-0.04
	1.46	0.60	-1.35	-0.76
Tangibility	-0.02	0.08	0.39 *	0.90 ***
	-0.07	0.33	1.73	3.27
Constant	-6.36 ***	-1.65	-4.01 **	-10.27 ***
	-3.12	-0.94	-2.15	-4.24
Pseudo R2	0.07	0.07	0.21	0.27
N	144	96	140	122
Sample:	A	B	C	D
	Low ESG borrowers	High ESG borrowers	High ESG banks	Low ESG banks

Notes: The table reveals the first stage results of the propensity score matching in which the propensity of being in a bank with high ESG performance or borrower with high ESG performance is estimated according to firm characteristics. The dependent variables are calculated as a dummy that equals zero for banks and borrowers in the lower quartile of ESG performance, and it is one when ESG performance is in the top quartile. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

Table 11: Propensity Score Matching - Average Treatment effect

Sample	Treated	Control	Diff.	S.E.	T-statistic	Treated	Controls	N
(A)	186.88	106.03	80.85	19.15	4.22	70	74	144
(B)	91.31	83.15	8.17	18.60	0.44	48	48	96
(C)	97.19	186.88	-89.69	19.46	-4.61	70	70	140
(D)	83.15	95.15	-12.00	17.83	-0.67	48	74	122

Notes: The table provides the average treatment effect on the treated, where the treated is the dependent variable of the first stage probit and the treatment effect is the spread difference between the treated and untreated (control) group. Sample A to D follows the definition shown in first stage probit table.

Table 12: Propensity Score Matching - Multivariate regression on matched samples

Dep.: Spread	Sample A	Sample B	Sample C	Sample D
Bank ESG (dummy)	63.15 ** (2.17)	27.36 (0.81)		
Borrower ESG (dummy)			-58.85 ** (2.00)	19.42 (0.66)
<u>Firm characteristics</u>				
Firm size	-38.12 ** (2.00)	28.75 (1.67)	7.97 (0.30)	-10.44 (0.60)
EBIT	-5.70 (0.06)	-171.37 (1.31)	-58.96 (1.38)	-173.01 ** (2.14)
MTB	-4.91 (0.86)	-5.89 (1.01)	1.34 (0.77)	-7.22 (1.61)
Leverage	1.44 (1.11)	4.53 ** (2.57)	2.68 ** (2.56)	0.53 (0.41)
Pricevol	5.87 ** (2.46)	2.62 (1.56)	2.88 (1.51)	4.04 ** (2.13)
Rating	-1.52 (0.29)	13.16 ** (2.17)	5.63 (1.15)	6.87 (1.19)
Tangibility	-22.66 (0.62)	-6.99 (0.19)	66.92 (1.64)	-36.26 (1.23)
<u>Loan characteristics</u>				
Secured	51.73 (1.58)	53.94 (1.40)	64.44 (1.47)	11.35 (0.31)
Numlenders	-45.15 *** (2.81)	-6.78 (0.42)	-6.50 (0.41)	3.64 (0.29)
Maturity	1.67 (1.59)	-0.66 (1.03)	0.84 (0.71)	-0.13 (0.17)
Loan size	-8.23 (0.59)	-28.07 * (1.88)	-20.03 (1.50)	19.23 (1.44)
Perfpricing	17.27 (0.54)	66.02 (1.41)	69.40 * (1.79)	-69.82 ** (2.05)
Covenants	-59.05 (1.50)	-79.53 (1.56)	-111.17 * (1.90)	62.70 ** (2.30)
<u>Fixed Effects</u>				
Type	Yes	Yes	Yes	Yes
Purpose	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Constant	741.20 (2.30)	-16.85 (0.06)	397.16 (0.82)	-305.35 (1.15)

Notes: The table shows the results of the multivariate regression on spread using the matched samples determined through propensity score matching. Sample A includes low ESG performance borrowers and observes the spread difference between high and low ESG banks. Sample B includes high ESG borrowers and shows the difference between high and low ESG banks. Sample C includes the high ESG performance banks and shows the spread difference for low and high ESG borrowers. Sample D includes low ESG banks and shows the spread difference between high and low ESG borrowers. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

be driving the result for borrowers with weak sustainability performance. To address this, I generate a proxy for this by taking the total number of different banks that a borrower receives loans from and develop a ratio that scales this number by the total number of loan observations that the number of banks is based on. The idea is that when a borrower has more options in terms of different banks that would offer them capital, the borrower may be able to switch between banks and hence the results of this study could be driven by borrowers that are constrained to certain banks. Table 13 in Panel A provides the results for the multivariate regression with interactions effects, controlling for the ratio of different banks to total loan observations. The control variables are the same as in the previous analyses. The results indicate that the findings are not driven by borrower access to banks. In Panel B, the analysis is run on a subsample of borrowers that are unrestricted and have at least two different banks that they obtain bank loans from in the sample. Although the sample is about a quarter, the results are similar. In untabulated tests I use the absolute number of different banks per borrower instead of the relative number and find very similar results. Selection does not appear to be a concern in this study.

4.6. Measurement Error

A concern about sustainability data is that it often contains qualitative and unaudited items, while transparency and comparability of items is not yet fully developed. We consider an alternative widely used data source for sustainability, although our ESG data source, Asset4, runs extensive quality controls to ensure high quality of the data. Asset4 data is collected from public sources in one of the largest ESG content collection operations in the world and undergoes more than 400 built-in error checks. This is followed by about 300 further automated screens that capture inconsistencies. Finally, the data undergoes independent audits and in-depths management checks.

Nevertheless I re-run all analyses using data from a different data provider, KLD, which belongs to one of the most used data providers for sustainability data in the academic world but also among practitioners. KLD provides company-specific data on strengths and concerns along the dimensions: community, corporate governance, diversity, employee relations, environment and human rights. They are compiled using public information such as financial statement data, media reports, government documents, and also surveys.

Following Goss and Roberts (2011), I run a principal component analysis along the strengths and along the concerns to extract the respective principal components. A scree plot shows a significant decline and leveling-off after the first component in both cases. The explanatory power of the first component in both cases accounts for approximately 30-40% of the total variation (eigenvalue to number of principal components). I include the first principal component for the sustainability strengths and the first component for the concerns jointly to test whether the results hold for this alternative measure of sustainability

Table 13: Borrower access to banks

Panel A: Controlling for relative number of different banks							
Dep.: Spread	(1)		(2)		(3)		(4)
Borrower score	125.84	**	77.74	*	25.20		125.30 **
	(2.00)		(1.84)		(0.84)		(2.23)
Bank score	116.13	**	22.27	*	23.31		162.53 ***
	(2.40)		(1.88)		(1.02)		(2.92)
Bank × Borrower ESG	-234.13	***					
	(2.77)						
Bank × Borrower ENV			-137.22	**			
			(2.50)				
Bank × Borrower SOC					-81.06	*	
					(1.90)		
Bank × Borrower GOV							-224.62 ***
							(2.97)
Ratio different banks	-1.22		-2.88		-0.34		-3.06
	(0.12)		(0.28)		(0.03)		(0.30)
Borrower characteristics	Yes		Yes		Yes		Yes
Loan characteristics	Yes		Yes		Yes		Yes
Fixed effects	Yes		Yes		Yes		Yes
adj. R^2	0.64		0.64		0.64		0.64
N	1,226		1,226		1,226		1,226
Panel B: Sample of unrestricted borrowers							
Dep.: Spread	(1)		(2)		(3)		(4)
Borrower score	289.48	**	94.23	*	106.22	*	126.95
	(2.37)		(1.21)		(1.82)		(0.95)
Bank score	318.81	***	61.64.27	**	103.94		277.75 *
	(3.18)		(2.48)		(2.07)		(1.91)
Bank × Borrower ESG	-514.97	***					
	(3.11)						
Bank × Borrower ENV			-180.81	*			
			(1.78)				
Bank × Borrower SOC					-247.11	***	
					(2.93)		
Bank × Borrower GOV							-287.21
							(1.54)
Borrower characteristics	Yes		Yes		Yes		Yes
Loan characteristics	Yes		Yes		Yes		Yes
Fixed effects	Yes		Yes		Yes		Yes
adj. R^2	0.71		0.73		0.73		0.72
N	378		378		378		378

Notes: The dependent variable is the loan spread. Column (1) reveals the relationship between borrower ESG and loan conditions including an interaction effect by Bank ESG performance. Columns (2) to (4) consider environmental performance, social, and governance performance. Borrower score and bank score are the respective baseline variables of the interactions. Panel A includes the variable "Ratio different banks" that proxies for how restricted borrowers are to banks. It reflects the total number of different banks that a borrower borrows from scaled by the total number of loan observations that this value is derived from. Panel B provides the results of the multivariate regression for borrowers with at least two different banks that they borrow from. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

performance. Using KLD strengths and weaknesses instead of the Asset4 ESG score does not change the results.

The results are provided in Table 14. The first column shows the interaction of bank and borrower sustainability performance considering borrower strengths according to KLD. In the second column, the concerns are interacted with borrower sustainability performance. Finally, in column 3, both interactions are included jointly. The results reveal that it is the concerns rather than the strengths in borrower ESG performance that are driving the results, in other words the downside variation of ESG scores as discussed in the previous results.

4.7. Time effects

To attain a deeper understanding of the relationship between borrower sustainability and loan spreads, time dynamics are taken into account. In the last decade, the quality and comparability of sustainability information has increased dramatically. This was complemented with a strong increase in scrutiny, especially of the banking sector after the financial crisis. The crisis in 2008 resulted not only in immediate economic and social consequences, but also in a severe disruption of trust in the financial system. From ordinary citizens, who stored their entire life savings at banks, to governments and regulators, people were devastated by the suddenly crystallized fragility of the financial system. Banks in particular came under the intense scrutiny of the media, regulators, and ordinary citizens and were often blamed for unethical and careless decisions, such as lending and re-securitizing opaque sub prime mortgages. This resulted in great pressure on banks to improve their practices and hence, it is expected that sustainability is a more prominent topic for banks in more recent years and in the wake of the crisis than prior to it. This has come at the same time with an increase in sustainability reporting internationally. To mention some examples of shifts towards sustainability, Bank of America began regularly publishing CSR reports from 2011 onwards, Barclays updated their sustainability reporting in 2013 from a more simple version that existed since 1998, and Wells Fargo developed a new CSR strategy in 2009 and started publishing regular reports from 2011 onwards. I hypothesize that the pricing of borrower sustainability into loan spreads increases over this time frame, with the increase in public monitoring and improvement in data availability.

To examine this empirically, a multivariate regression with an interaction term between year and borrower ESG in the basic regression of borrower ESG on loan spreads is employed. The results are presented in Table 15. Columns (1) to (4) depict the interaction effects for the full sample using year interactions with borrower ESG performance. The coefficient estimates indicate that with progression of time, borrower ESG performance has a stronger relationship with loan spreads.

For columns (5) to (8), a dummy variable is constructed that equals 0 for the years 2002 to 2008 and it equals 1 for the years 2009 to 2015. This provides a broader measurement of the

Table 14: KLD sustainability performance interaction

Dep.: Spread	(1)		(2)		(3)	
Bank score	-20.18 (1.21)		-16.24 (0.99)		-16.68 (1.01)	
KLD ESG strengths	2.21 (0.17)				8.76 (0.67)	
Bank score × KLD ESG strengths	-10.54 (0.57)				-17.85 (1.01)	
KLD ESG concerns			-12.22 (2.24)	**	-14.26 (2.49)	**
Bank score × KLD ESG concerns			18.62 (2.24)	**	21.90 (2.63)	***
<u>Borrower characteristics</u>						
Firm size	0.59 (0.17)		-4.01 (1.12)		-0.84 (0.24)	
EBIT	-10.60 (0.52)		-14.97 (0.72)		-12.72 (0.61)	
MTB	-0.85 (3.75)	***	-0.91 (4.11)	***	-0.83 (4.09)	***
Leverage	0.78 (4.11)	***	0.81 (4.16)	***	0.79 (4.16)	***
Pricevol	3.68 (6.95)	***	3.73 (6.83)	***	3.67 (6.88)	***
Rating	1.10 (0.83)		0.60 (0.46)		0.52 (0.40)	
Tangibility	-19.53 (3.23)	***	-20.59 (3.32)	***	-18.78 (3.11)	***
<u>Loan characteristics</u>						
Secured	29.68 (3.52)	***	31.62 (3.55)	***	32.00 (3.63)	***
Numlenders	-10.82 (3.02)	***	-8.54 (2.31)	**	-9.54 (2.63)	***
Maturity	0.54 (2.63)	***	0.40 (1.95)	*	0.41 (2.08)	**
Loansize	-6.08 (1.57)		-7.39 (1.93)	*	-7.15 (1.81)	*
Perfpricing	-9.17 (1.13)		-10.15 (1.21)		-10.35 (1.24)	
Covenants	9.86 (1.13)		12.80 (1.43)		12.48 (1.40)	
<u>Fixed effects</u>						
Type	Yes		Yes		Yes	
Purpose	Yes		Yes		Yes	
Year	Yes		Yes		Yes	
Industry	Yes		Yes		Yes	
Constant	85.76 -1.22		180.32 -2.66	***	137.75 -1.82	*
adj. R^2	0.66		0.66		0.67	
N	999		999		999	

Notes: The dependent variable is the loan spread. In column (1) KLD ESG strengths are included as an interaction with bank ESG performance. In column (2) KLD ESG concerns are included as an interaction with bank ESG performance. Column (3) includes both interactions simultaneously. Variable definitions can be found in appendix 16. Standard errors are clustered on the bank-borrower relationship level. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

time dynamics by splitting the sample around the crisis. The interaction term of this dummy variable with borrower ESG measures reveals that the pricing of borrower sustainability is stronger after the crisis, consistent with our expectation that the importance of borrower sustainability for banks increased after the crisis.

Table 15: Time effects

Dep. Spread	Year interactions				Post crisis interactions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time × ESG	-15.52*** (4.31)				-129.25*** (4.20)			
Time × ENV		-10.54*** (3.99)				-93.59*** (4.20)		
Time × SOC			-10.57*** (4.02)				-94.08*** (4.01)	
Time × GOV				-16.42*** (3.94)				-116.54*** (3.18)
Loan controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Main effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,226	1,226	1,226	1,226	1,226	1,226	1,226	1,226
Adj. R^2	0.51	0.51	0.51	0.51	0.58	0.57	0.57	0.57

Notes: The table shows the interaction borrower ESG performance with time. Columns (1) to (4) depict time measured as years, while columns (5) to (8) employ a dummy variable that equals one when the year is 2009 or above, it is zero otherwise. All control variable are included from the previous multivariate regression models, including loan and firm controls, fixed effects, and the main effects of the interactions. Absolute values of the t-statistics are in parenthesis. Significance at the 10%, 5%, and 1% levels are indicated by *, **, ***, respectively.

5. Conclusion

This study reveals that although superior borrower sustainability performance reduces loan spreads, this only holds true when the corresponding banks exhibit high sustainability performance as well. Using sample splits, interaction effects, propensity score matching, as well as within-firm and within-bank identification methods I find that variation in loan spreads due to sustainability performance of borrowers is only found when banks have high sustainability performance. Disentangling the effects reveals that the difference in spreads is based on a premium for borrowers with low sustainability performance rather than a discount due to good sustainability performance. In other words, it appears that being more sustainability is not beneficial, but rather it is a necessity in order to achieve desirable loan spreads from banks that care about sustainability. From the ESG dimensions, governance seems to be the predominantly important factor for banks, while environmental and social are of similar importance. The measurement and comparability of governance has been

established for a longer time than environmental and social sustainability and hence may be easier to integrate in the decision-making process. It is also likely to be of primary importance to banks due to the contractual nature of the relationship with the borrowing corporation. A borrower that has governance concerns and misaligned incentives may not ensure that capital flows are employed to the best usage for the bank, but rather to the benefit of stakeholders with stronger power, such as executives or directors.

This study provides first insights into the role of sustainability in the relationship between banks and their borrowers and motivates further research into the area. Previous research has so far focused on aggregate effects, regardless of lender sustainability, however these results indicate that the literature may benefit and improve causality inferences by disentangling these effects. This study is the first to our knowledge to show that the relationship between sustainability and access to bank loan capital is driven only by more sustainable banks, that the spread difference is based on a premium rather than a discount, and also add to the literature by using different approaches to gain an understanding of the causality behind these findings.

The study has several limitations. First, the international representativeness of our results remains to be tested, as our study is based on U.S. data.⁴ Although I attempt to achieve a clean bank sustainability effect by considering only loans with one lead arranger, the question remains if and how other lenders within the syndicate and their sustainability performance may affect loan pricing.⁵ Furthermore, I recognize that ESG data may be subject to measurement errors and validity concerns, as standardization and coverage of sustainability reporting is still being developed. However the primary sustainability data in this study, Asset4, is one of the highest quality datasets available for this purpose. In addition, this study considers KLD data as an alternative measure for sustainability performance and uses a different measurement of sustainability (dividing it in strengths and weaknesses in additions to an ESG score). This provides me with sufficient confidence on the validity of the data.

Another question that remains outstanding at this point is why borrowers with low sustainability performance borrow from banks with high sustainability in the first place, if they would be receiving better loan spreads from less sustainable banks. There can be several possible explanations, including availability of banks and learning, that need to be investigated into. I address this issue in the section on selection to ensure that the results are not driven by this. However understanding the matching between banks and borrowers is an interesting topic that remains to be explored in the context of sustainability. A deeper

⁴For example, Hoepner et al. (2016) find that country sustainability scores, in particular environmental sustainability, are associated with cost of debt.

⁵In untabulated analyses I use a cross-country sample with multiple lead arrangers and find similar results using weighted-average lead arranger sustainability scores. Due to the trade-off between bank sustainability score precision and international representativeness, I decided in favor of precision and to focus on loans with only one lead arranger, limiting our sample to the U.S. data.

analysis of bank characteristics may be useful for this purpose. Furthermore, a thorough analysis of the individual ESG factors and how their components drive the results will be helpful to researchers and practitioners alike. I acknowledge the aforementioned caveats and extended research questions and encourage future research to address these points.

Bank loans are the most important source of capital and yet to date we lack a clear understanding of the role of banks in whether and how they value the sustainability performance of their borrowers. This study is one of the first to attempt to provide clarity on this matter by taking into account both the bank and borrower side of the loan contract. This enables us to pinpoint under which conditions sustainability performance is financially beneficial, provides evidence on the underlying mechanisms, and offers direction into relevant future research and policy directions.

References

- Barigozzi, F., Tedeschi, P., 2014. Credit markets with ethical banks and motivated borrowers. *Review of Finance* 19 (3), 1281–1313.
- Bauer, R., Frijns, B., Otten, R., Tourani-Rad, A., 2008. The impact of corporate governance on corporate performance: Evidence from Japan. *Pacific-Basin Finance Journal* 16 (3), 236–251.
- Bauer, R., Hann, D., 2010. Corporate environmental management and credit risk. Available at SSRN.
- Becchetti, L., Ciciretti, R., Hasan, I., Kobeissi, N., 2012. Corporate social responsibility and shareholder's value. *Journal of Business Research* 65 (11), 1628–1635.
- Bhojraj, S., Sengupta, P., 2003. Effect of corporate governance on bond ratings and yields: The role of institutional investors and outside directors. *The Journal of Business* 76 (3), 455–475.
- Bottazzi, L., Da Rin, M., Hellmann, T., 2016. The importance of trust for investment: Evidence from venture capital. *The Review of Financial Studies* 29 (9), 2283–2318.
- Bragdon, J. H., Marlin, J., 1972. Is pollution profitable? *Risk Management* 19, 9–18.
- Brammer, S., Millington, A., 2008. Does it pay to be different? An analysis of the relationship between corporate social and financial performance. *Strategic Management Journal* 29 (12), 1325–1343.
- Cahan, S. F., Chen, C., Chen, L., Nguyen, N. H., 2015. Corporate social responsibility and media coverage. *Journal of Banking & Finance* 59, 409–422.
- Chava, S., 2014. Environmental externalities and cost of capital. *Management Science* 60 (9), 2223–2247.
- Chemmanur, T. J., Fulghieri, P., 1994. Investment bank reputation, information production, and financial intermediation. *The Journal of Finance* 49 (1), 57–79.
- Cheng, B., Ioannou, I., Serafeim, G., 2014. Corporate social responsibility and access to finance. *Strategic Management Journal* 35 (1), 1–23.
- Cheng, C., Wang, J., Zhang, N., Zhao, S., 2015. Bowling alone, bowling together: Is social capital priced in bank loans? Available at SSRN.
- Chih, H.-L., Chih, H.-H., Chen, T.-Y., 2010. On the determinants of corporate social responsibility: International evidence on the financial industry. *Journal of Business Ethics* 93 (1), 115–135.
- Cochran, P. L., Wood, R. A., 1984. Corporate social responsibility and financial performance. *Academy of Management Journal* 27 (1), 42–56.
- David, P., Bloom, M., Hillman, A. J., 2007. Investor activism, managerial responsiveness, and corporate social performance. *Strategic Management Journal* 28 (1), 91–100.
- Deng, X., Kang, J.-k., Low, B. S., 2013. Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics* 110 (1), 87–109.
- Dennis, S. A., Mullineaux, D. J., 2000. Syndicated loans. *Journal of Financial Intermediation* 9 (4), 404–426.
- Deutsche Bank, 2016. Corporate governance: Taking on responsibility in the banking business, last accessed: 2017-08-08.
URL db.com/cr/en/responsible-business/responsible-business
- Dhaliwal, D. S., Li, O. Z., Tsang, A., Yang, Y. G., 2011. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review* 86 (1), 59–100.
- Drucker, S., Puri, M., 2009. On loan sales, loan contracting, and lending relationships. *Review of Financial Studies* 22 (7), 2835–2872.
- Eccles, R. G., Ioannou, I., Serafeim, G., 2014. The impact of corporate sustainability on organizational processes and performance. *Management Science* 60 (11), 2835–2857.
- Fatemi, A., Fooladi, I., Tehranian, H., 2015. Valuation effects of corporate social responsibility. *Journal of Banking & Finance* 59, 182–192.
- Ferrell, A., Liang, H., Renneboog, L., 2016. Socially responsible firms. *Journal of Financial Economics* 122 (3),

585 – 606.

URL <http://www.sciencedirect.com/science/article/pii/S0304405X16301519>

- Flammer, C., 2013. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Academy of Management Journal* 56 (3), 758–781.
- Fombrun, C. J., Gardberg, N. A., Barnett, M. L., 2000. Opportunity platforms and safety nets: Corporate citizenship and reputational risk. *Business and Society Review* 105 (1), 85–106.
- Friede, G., Busch, T., Bassen, A., 2015. Esg and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment* 5 (4), 210–233.
- Friedman, M., 1970. The social responsibility of business is to increase its profits. *New York Times*, 122–124.
- Fulmer, C. A., Gelfand, M. J., 2012. At what level (and in whom) we trust trust across multiple organizational levels. *Journal of Management* 38 (4), 1167–1230.
- Giannetti, M., Yafeh, Y., 2012. Do cultural differences between contracting parties matter? evidence from syndicated bank loans. *Management Science* 58 (2), 365–383.
- Gits, F., Watson, J., Waterman, C., 2015. Evaluating corporate governance. *Fitch Ratings Credit Policy*.
- Glac, K., 2014. The influence of shareholders on corporate social responsibility. *Economics, Management and Financial Markets* 9 (3), 34.
- Gollier, C., Pouget, S., 2014. The” washing machine”: Investment strategies and corporate behavior with socially responsible investors. Available at SSRN.
- Goss, A., Roberts, G. S., 2011. The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking & Finance* 35 (7), 1794–1810.
- Greening, D. W., Turban, D. B., 2000. Corporate social performance as a competitive advantage in attracting a quality workforce. *Business & Society* 39 (3), 254–280.
- Grewal, J., Hauptmann, C., Serafeim, G., 2017. Stock price synchronicity and material sustainability information. *Harvard Business School Working Paper* (17–098).
- GRI, 2016. About gri, last accessed: 2016-07-25.
URL globalreporting.org/information/about-gri
- Guenster, N., Bauer, R., Derwall, J., Koedijk, K., 2011. The economic value of corporate eco-efficiency. *European Financial Management* 17 (4), 679–704.
- Hasan, I., Hoi, C. K., Wu, Q., Zhang, H., 2017. Social capital and debt contracting: Evidence from bank loans and public bonds. *Journal of Financial and Quantitative Analysis*, 1–31.
- Heal, G., 2005. Corporate social responsibility: An economic and financial framework. *The Geneva papers on risk and insurance Issues and practice* 30 (3), 387–409.
- Hillman, A. J., Keim, G. D., 2001. Shareholder value, stakeholder management, and social issues: what’s the bottom line? *Strategic Management Journal* 22 (2), 125–139.
- Hoepner, A., Oikonomou, I., Scholtens, B., Schröder, M., 2016. The effects of corporate and country sustainability characteristics on the cost of debt: an international investigation. *Journal of Business Finance & Accounting* 43 (1-2), 158–190.
- Hong, H., Kacperczyk, M., 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics* 93 (1), 15–36.
- Hörter, S., 2016. Esg in investment grade corporate bonds. *Allianz Global Investors*.
- Ioannou, I., Serafeim, G., 2010. The impact of corporate social responsibility on investment recommendations. In: *Academy of Management Proceedings*. Vol. 2010. Academy of Management, pp. 1–6.
- Ioannou, I., Serafeim, G., 2014. The consequences of mandatory corporate sustainability reporting: evidence from four countries. *Harvard Business School Research Working Paper* (11-100).
- Kapstein, E. B., 2001. The corporate ethics crusade. *Foreign Affairs*, 105–119.
- Khan, M., Serafeim, G., Yoon, A., 2016. Corporate sustainability: First evidence on materiality. *The Accounting Review* 91 (6), 1697–1724.

- Kim, M., Surroca, J., Tribó, J. A., 2014. Impact of ethical behavior on syndicated loan rates. *Journal of Banking & Finance* 38, 122–144.
- Kleimeier, S., Viehs, M., 2016. Carbon disclosure, emission levels, and the cost of debt. Available at SSRN.
- Koh, P.-S., Qian, C., Wang, H., 2014. Firm litigation risk and the insurance value of corporate social performance. *Strategic Management Journal* 35 (10), 1464–1482.
- Krüger, P., 2015. Corporate goodness and shareholder wealth. *Journal of Financial Economics* 115 (2), 304–329.
- Lee, D. D., Faff, R. W., 2009. Corporate sustainability performance and idiosyncratic risk: A global perspective. *Financial Review* 44 (2), 213–237.
- Lewicki, R. J., McAllister, D. J., Bies, R. J., 1998. Trust and distrust: New relationships and realities. *Academy of Management Review* 23 (3), 438–458.
- Lim, J., Minton, B. A., Weisbach, M. S., 2014. Syndicated loan spreads and the composition of the syndicate. *Journal of Financial Economics* 111 (1), 45–69.
- Margolis, J. D., Elfenbein, H. A., Walsh, J. P., 2007. Does it pay to be good? a meta-analysis and redirection of research on the relationship between corporate social and financial performance. *Ann Arbor* 1001, 48109–1234.
- Margolis, J. D., Walsh, J. P., 2003. Misery loves companies: Rethinking social initiatives by business. *Administrative Science Quarterly* 48 (2), 268–305.
- Maskara, P. K., 2010. Economic value in tranching of syndicated loans. *Journal of Banking and Finance* 34 (5), 946–955.
- Moro, A., Fink, M., 2013. Loan managers trust and credit access for smes. *Journal of Banking & Finance* 37 (3), 927–936.
- Moskowitz, 1972. Choosing socially responsible stocks. *Business and Society Review* 1, 71–75.
- Neubaum, D. O., Zahra, S. A., 2006. Institutional ownership and corporate social performance: The moderating effects of investment horizon, activism, and coordination. *Journal of Management* 32 (1), 108–131.
- Nooteboom, B., Berger, H., Noorderhaven, N. G., 1997. Effects of trust and governance on relational risk. *Academy of Management Journal* 40 (2), 308–338.
- Orlitzky, M., Schmidt, F. L., Rynes, S. L., 2003. Corporate social and financial performance: A meta-analysis. *Organization Studies* 24 (3), 403–441.
- Pelozo, J., 2006. Using corporate social responsibility as insurance for financial performance. *California Management Review* 48 (2), 52–72.
- Pouget, S., 2014. On the financial performance of socially responsible investments. *Bankers, Markets & Investors* (128), 31–35.
- Preston, L. E., O’Bannon, D. P., 1997. The corporate social-financial performance relationship: A typology and analysis. *Business & Society* 36 (4), 419–429.
- Renneboog, L., Ter Horst, J., Zhang, C., 2008. Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking & Finance* 32 (9), 1723–1742.
- Reuters, T., 2015. Loanconnector, last accessed August 2015.
- Ring, P. S., Van de Ven, A. H., 1992. Structuring cooperative relationships between organizations. *Strategic Management Journal* 13 (7), 483–498.
- Scholtens, B., 2006. Finance as a driver of corporate social responsibility. *Journal of Business Ethics* 68 (1), 19–33.
- Scholtens, B., 2009. Corporate social responsibility in the international banking industry. *Journal of Business Ethics* 86 (2), 159–175.
- Serafeim, G., 2014. Turning a profit while doing good: aligning sustainability with corporate performance. Available at SSRN.
- Sharfman, M. P., Fernando, C. S., 2008. Environmental risk management and the cost of capital. *Strategic*

- Management Journal 29 (6), 569–592.
- Shi, G., Sun, J., 2015. Corporate bond covenants and social responsibility investment. *Journal of Business Ethics* 131 (2), 285–303.
- Simpson, W. G., Kohers, T., 2002. The link between corporate social and financial performance: Evidence from the banking industry. *Journal of Business Ethics* 35 (2), 97–109.
- Sjöström, E., 2008. Shareholder activism for corporate social responsibility: what do we know? *Sustainable Development* 16 (3), 141–154.
- Stellner, C., Klein, C., Zwergel, B., 2015. Corporate social responsibility and eurozone corporate bonds: The moderating role of country sustainability. *Journal of Banking & Finance* 59, 538–549.
- Strahan, P. E., 1999. Borrower risk and the price and nonprice terms of bank loans. *FRB of New York Staff Report* (90).
- Surroca, J., Tribó, J. A., 2008. Managerial entrenchment and corporate social performance. *Journal of Business Finance & Accounting* 35 (5-6), 748–789.
- Turban, D. B., Greening, D. W., 1997. Corporate social performance and organizational attractiveness to prospective employees. *Academy of Management Journal* 40 (3), 658–672.
- Waddock, S. A., Graves, S. B., 1997. The corporate social performance-financial performance link. *Strategic management journal*, 303–319.
- Williams, M., 2001. In whom we trust: Group membership as an affective context for trust development. *Academy of Management Review* 26 (3), 377–396.
- Wu, M.-W., Shen, C.-H., 2013. Corporate social responsibility in the banking industry: Motives and financial performance. *Journal of Banking & Finance* 37 (9), 3529–3547.

Appendices

Table 16: Variable definitions

Variable	Definition	Source
<u>ESG criteria</u>		
ESG score	The equally weighted rating of environmental, social and corporate governance performance.	Asset4
ENV score	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.	Asset4
SOC score	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.	Asset4
GOV score	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.	Asset4
<u>Borrower characteristics</u>		
Firm size	The natural logarithm of total assets, where assets are measured in million Euros.	Orbis
EBIT	Earnings before interest and taxes.	Orbis
MTB (ratio)	Market to book value.	Orbis
Leverage (ratio)	Debt to total assets ratio.	Orbis
Pricevol	Stock price volatility.	Orbis
Tangibility (ratio)	The natural logarithm of net tangible assets to total assets.	Orbis
Rating (indicator)	Firm's long-term senior debt rating.	DealScan
<u>Loan characteristics</u>		
Spread	Spread over the LIBOR, including any fees.	DealScan
Secured (indicator)	Indicator = 1 if the loan type is secured, 0 otherwise.	DealScan
Numlenders	Number of lending banks in the syndicate.	DealScan
Maturity	Natural log of the maturity of the loan facility in months.	DealScan
Loansize	The firm's tranche size measured as the natural logarithm in thousand Euros.	DealScan
Perf. pricing (indicator)	Indicator = 1 if performance pricing, 0 otherwise.	DealScan
Covenants (indicator)	Indicator = 1 if covenants attached to loan, 0 otherwise.	DealScan
Loan type	Indicators that capture the type of loan e.g. term loan, revolver, other.	DealScan
Loan purpose	Indicators that capture the purpose of the loan.	DealScan

Notes: The table provides variable definitions of the key variables. All variables are recorded at time t , where t ranges from 2002 to 2015. Further information on the variables can be found from the respective data sources.

Table 17: Correlations

(1) Borrower ESG	1.00																			
(2) Borrower ENV	0.88	1.00																		
(3) Borrower SOC	0.88	0.67	1.00																	
(4) Borrower GOV	0.66	0.39	0.42	1.00																
(5) Bank ESG	0.10	0.13	0.05	0.05	1.00															
(6) Bank ENV	0.07	0.11	0.03	0.02	0.91	1.00														
(7) Bank SOC	0.09	0.10	0.04	0.07	0.85	0.67	1.00													
(8) Bank GOV	0.06	0.07	0.05	0.01	0.25	0.01	-0.05	1.00												
(9) Firm size	0.33	0.32	0.34	0.10	0.07	0.02	0.09	0.08	1.00											
(10) EBIT	-0.05	-0.06	-0.03	-0.02	0.01	0.03	0.02	-0.06	0.17	1.00										
(11) MTTB	0.00	0.02	-0.01	0.00	-0.01	-0.02	-0.01	0.01	-0.03	0.00	1.00									
(12) Leverage	-0.02	0.06	-0.07	-0.06	0.06	0.06	0.07	-0.01	0.24	0.12	0.04	1.00								
(13) Pricevol	-0.17	-0.18	-0.18	-0.01	0.09	0.08	0.06	0.05	-0.27	-0.20	0.02	-0.12	1.00							
(14) Tangibility	0.00	-0.02	-0.03	0.06	-0.06	-0.02	-0.07	-0.06	-0.53	-0.13	-0.23	-0.42	0.05	1.00						
(15) Spread	-0.17	-0.12	-0.17	-0.12	0.14	0.17	0.07	0.02	-0.20	-0.08	-0.02	0.17	0.44	-0.05	1.00					
(16) Secured	-0.14	-0.12	-0.14	-0.08	0.04	0.04	0.07	-0.04	-0.23	-0.09	-0.02	0.05	0.40	0.12	0.41	1.00				
(17) Numlenders	0.06	0.02	0.06	0.08	-0.18	-0.19	-0.18	0.06	0.21	0.03	-0.03	-0.01	-0.16	-0.02	-0.34	-0.10	1.00			
(18) Maturity	-0.11	-0.10	-0.10	-0.07	0.14	0.14	0.13	0.01	-0.27	0.02	0.01	-0.03	0.15	0.18	0.17	0.22	0.02	1.00		
(19) Loansize	0.29	0.27	0.27	0.14	0.04	-0.01	0.02	0.14	0.50	0.10	0.01	0.18	-0.18	-0.16	-0.19	-0.06	0.40	0.02	1.00	
(20) Perfpricing	-0.05	-0.05	-0.06	0.01	-0.07	-0.06	-0.07	-0.01	-0.21	-0.07	-0.02	-0.11	-0.01	0.19	-0.10	0.09	0.25	0.14	0.09	1.00
(21) Covenants	-0.09	-0.09	-0.10	0.00	-0.01	0.00	-0.01	-0.02	-0.24	-0.05	-0.03	-0.12	0.10	0.20	0.06	0.27	0.11	0.13	0.02	0.65

Notes: The table provides the pairwise correlations between the variables employed in this study. Correlations depicted in bold are significant at the 10% or higher level. Variable definitions can be found in appendix 16.

Table 18: Bank borrower matching

Variables	N	Mean spread	Std. Dev.	Difference	t-value
Total assets	331	15,200,000.00	38,700,000.00	686,403.90	0.21
	282	14,500,000.00	42,900,000.00		
EBIT	331	0.18	0.18	0.02	0.91
	282	0.16	0.26		
MTB	331	3.61	5.67	1.09	1.42
	282	2.53	12.49		
Leverage	331	28.70	18.59	2.08	1.40
	282	26.62	18.18		
Pricevol	331	27.91	7.86	-2.87	-4.25
	282	30.78	8.87		
Tangibility	331	0.39	0.21	-0.00	-0.12
	282	0.39	0.21		

Notes: The table shows the mean difference in borrower characteristics for borrowers with below median ESG scores that borrower from low vs. high ESG banks, respectively. The number of observations is not balanced, as I do not re-split the sample into different sets of bank ESG scores after excluding high sustainability borrowers. Instead, I use the former classification based on the entire sample, such that any differences in these subsamples remain evident. The unbalanced sample further indicates that borrowers with lower sustainability performance have slightly more loans with low-sustainability banks rather than high sustainability banks as expected.