The pricing of sustainable syndicated loans

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Abstract

This paper provides a comparative analysis of sustainable and conventional syndicated loan spreads and pricing. Using a cross-section of 24,962 syndicated loan tranches closed between 2018 and 2022 in OECD countries, we show that sustainable and conventional loans are differently priced, spreads of sustainable versus conventional loans do not differ significantly, and banks rely on contractual, macroeconomic, bank syndicate structure, and borrowers' characteristics when pricing sustainable tranches. At the deal-level, our results do not support the hypothesis of sustainable debt financing as a mechanism for reducing firms' funding costs. We also find that economies of scale, institutional, and information asymmetry arguments affect firms' choice between sustainable and conventional syndicated deals.

Key words: ESG; syndicated loans; credit spreads; loan pricing; cost of borrowing.
JEL classification: G12; G23; G32; Q56

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1. Introduction

Since the Paris Climate Agreement in 2015, firms have been integrating environmental, social, and governance (ESG) based solutions into their strategies, ranging from guaranteeing inclusiveness in their workforce, leading environmental initiatives or reinforcing their governance structures (Krueger *et al.*, 2020; Cornell and Shapiro, 2021; Edmans and Kacperczyk, 2022; Pollman, 2022; Edmans, 2023). However, the United Nations Commission on Trade and Development estimates a yearly gap in Sustainable Development Goals financing of $4.3 trillion until 2030 (UNCTAD, 2022). Under this framework, the support of the financial system in directing funds toward sustainable development becomes crucial.

Among available sustainable debt financing instruments, sustainable bonds represent a rapidly growing financial asset class.[1] Likewise, sustainable syndicated lending - sustainability-linked, social, and green syndicated loans[2] - totaled $716.6 billion during 2021, more than tripling 2020 levels and setting an all-time full-year record. Despite this exponential growth of the sustainable syndicated loan market in the last decade, representing a 14.6% stake of the global syndicated lending in 2022 ($693.4 billion for a total of $4,737.2 billion),[3] further analyses on how this bank debt class work is still needed. For example, are sustainable and standard syndicated corporate loans similarly priced? Why do corporates choose to close sustainable loans over standard syndicated loans? Are sustainable loan spreads lower than the spreads of similar syndicated loans? These are the questions that we explore in this paper.

This work contributes to three strands of the literature. First, we contribute to extant literature on the determinants of syndicated loan spreads. While theoretical and empirical literature on traditional

[1] According to Refinitiv Deals Intelligence reviews, sustainable finance - green, social, and sustainability - bond issuance surpassed $1.0 trillion for the first time during 2021, an increase of 45% compared to 2020.

[2] Green and social loans are loan instruments made available exclusively to (re)finance eligible green and social projects, respectively. Sustainability-linked loans are loan instruments for which the economic characteristics can vary depending on whether the borrower achieves predetermined ESG objectives. The Loan Market Association (LMA), the Asia Pacific Loan Market Association (APLMA), and the Loan Syndications and Trading Association (LTSA) have released the Green Loan Principles (GLP) in 2018, the Sustainability Linked Loan Principles (SLLP) in 2019, and the Social Loan Principles (SLP) in 2021. For further details see: https://www.lsta.org/content/?_industry_sector=guidelines-memos-primary-market.

[3] Sustainable Finance Review, full year 2021; Global Syndicated Loans Review, full year 2022. Source: Refinitiv (https://www.refinitiv.com/dealsintelligence).

syndicated loan pricing is vast,[4] research on sustainable syndicated loan spread determinants is practically non-existent. The previous literature focuses on the analysis of the impact of corporate social responsibility on loan spreads (Goss and Roberts, 2011), the causal relation between firms' social capital levels and the cost of bank financing (Hasan *et al.*, 2017), the association between firm exposure to carbon risk through carbon emissions and syndicated loan spreads (Kleimeier and Viehs, 2018; Ehlers *et al.*, 2022; Degryse *et al.*, 2023; Ho and Wong, 2023), or whether physical climate change risks are priced in the corporate loan market (Delis *et al.*, 2018; Correa *et al.*, 2023); but not on the analysis of sustainable loan spreads' determinants. This can be explained by the fact that the sustainable loan market is very recent and only in the last couple of years has it become more mature (Loumioti and Serafeim, 2023). We believe our study is the first to examine how common pricing factors compare between sustainable and conventional syndicated loans, and to analyze the pricing determinants of sustainable loans.

Second, this paper also contributes to recent literature that examines if sustainable debt instruments have lower spreads than traditional alternatives. Authors focus essentially on market financing via green bonds and find mixed evidence: although Tang and Zhang (2020) and Flammer (2021) find that the yields of green *versus* brown bonds do not differ significantly; several studies find a negative yield spread (Wang *et al.*, 2020; Fatica *et al.*, 2021; Löffler *et al.*, 2021; Caramichael and Rapp, 2022). Regarding the corporate syndicated loan market, banks can offer sustainable syndicated loans as a way of mitigating moral hazard and adverse selection costs with respect to borrowers' ESG activities (Christensen *et al.*, 2021; Flammer, 2021; Loumioti and Serafeim, 2023). Considering that there is an inverse relation between ESG risk and credit riskiness (e.g., Goss and Roberts, 2011; Chava, 2014; Hock *et al.*, 2020), we would expect sustainable loans to have lower spreads than comparable conventional loans. To the best of our knowledge, there are only two papers that make a preliminary analysis of this issue. Despite their focus on the economic motivations of borrowers and lenders driving sustainable loans, Du *et al.* (2023) and Kim *et al.* (2023) find that spreads at closing do not differ significantly between sustainability-linked loans and matched conventional loans. However, Kim *et al.* (2023) find evidence of a

[4] See, among others, Carey and Nini (2007), Qian and Strahan (2007), Bae and Goyal (2009), Maskara (2010), Bharath *et al.* (2011), Lim *et al.* (2014), and Cumming *et al.* (2020).

greenium effect when comparing green with nongreen syndicated loans. We extend this literature by focusing on sustainable loan pricing and examining sub-samples of sustainability-linked, green, and social loans, following an instrumental variable approach to address maturity and spreads being jointly determined, and as the choice between sustainable and conventional syndicated loans may be endogenous to spreads, using endogenous switching regression models.

Third, the paper also contributes to the literature that studies what are the determinants of firms using sustainable debt instruments. Extant literature presents the cost of capital motivation as one of the key reasons (Fama, 2021; Pedersen et al., 2021; Pástor et al., 2021; Gao and Schmittmann, 2022). If lenders are willing to trade-off financial returns for societal benefits, sustainable loans can be used by firms to reduce the cost of financing (Flammer, 2021). The closest works to ours is Loumioti and Serafeim's (2023), who focus on the analysis of which type of borrowers are more likely to receive sustainability-linked financing, and the relation between a borrower's ESG risk and the characteristics of sustainability performance indicators and pricing incentives. We extend this literature by analysing if the cost of borrowing affects firms' choice between sustainable and conventional loans. This is of particular interest since, in our sample, 714 deals are issued by switchers, firms that choose both debt types in the sampling period.

Using a large sample of syndicated loans (712 sustainable loans and 24,250 traditional corporate loans, worth $527.8 billion and $11,027.3 billion, respectively) closed by firms located in OECD countries in the 2018-2022 period, we document that sustainable and conventional loans are differently priced. Results obtained from a generalized method-of-moments (GMM) estimation method show that factors important for conventional loan pricing, such as credit rating, if the tranche is subordinated and the borrower's level of experience in the syndicated loan market, lead bank's reputation and number of banks involved, and market volatility are also important for determining spreads on sustainable loans. However, common pricing factors that affect conventional loan pricing, such as time to maturity, borrower's rating, transaction size, and type of financial system and shareholders' protection level in the borrower's country, do not influence sustainable loan spreads.

Our findings document that sustainable loan spreads do not differ significantly from those of comparable conventional loans, in line with the results of Tang and Zhang (2020) and Flammer (2021) for green bonds and Du

et al. (2023) and Kim *et al.* (2023) for sustainability-linked loans. Contrary to Kim *et al.* (2023), we do not find evidence of a greenium effect when comparing green loans with comparable conventional loans. Therefore, we do not corroborate the hypotheses of banks offering sustainable syndicated loans as a way of mitigating moral hazard and adverse selection costs with respect to borrowers' ESG activities; or that banks demand lower loan spreads in anticipation of the potential lower risks they face in debt contracting for firms with better ESG performance (Chava, 2014; Nguyen et al., 2023). Although we use virtually all sustainable loans with available spread information closed since 2018, our sample is about 3% of the total sample amount. In addition, the choice between sustainable and conventional syndicated deals may be endogenous to spreads. To mitigate these effects, we (*i*) build a loan-level matched sample of conventional loans following Flammer (2021) - for each sustainable loan, we match an otherwise similar conventional loan by the same borrower -; and (*ii*) use an endogenous switching regression model (Lokshin and Sajaia, 2004) to study the pricing, taking into consideration the potential self-selection by firms between closing sustainable *versus* conventional deals. Our results hold when we use these methodologies.[5]

Our evidence is not consistent with the cost of capital motivation for firms using sustainable debt funding. Findings at the deal level indicate that the cost of borrowing, measured by deals' *weighted average spread* (WAS), does not differ significantly between sustainable *vis-à-vis* conventional syndicated deals. Furthermore, considering that compared to conventional syndicated loan financing, sustainable deals are more restrictive, as the proceeds from sustainable loans are committed to ESG-aligned projects, and entail more transaction costs namely for first-time borrowers, because borrowers must appoint an external review provider to assess the alignment of their loans or develop the internal expertise to confirm alignment with the sustainable loan principles, and there is limited enforcement of the law for supervising their integrity, we would address the following question: what are the benefits other than borrowing costs that determine firms' decision of choosing sustainable *vis-à-vis* conventional syndicated deals?

[5] To create a matched sample of conventional loans, we employ a propensity score matching (PSM) by creating a 1 to 1 matching algorithm that captures the most identical loan closed by the same borrower in the same year, using the following characteristics: credit rating, loan size, and maturity.

We find strong evidence that sustainable loan financing mitigates the deadweight costs of asymmetric information frictions. Borrowers that choose sustainable deals seek long-term financing and deals are more likely to be syndicated by relationship banks and closed by switchers. Results seem to be consistent with the prediction that firms choose sustainable financing for larger debt borrowings because of the potential economies of scale in relation to issuance costs. As in Kim *et al.* (2023), our findings suggest that sustainable deals are extended to firms with better creditworthiness. In addition, we find that smaller and more concentrated syndicates decrease the probability of observing a sustainable deal over a conventional one. Institutional factors also affect firms' choice: borrowers in countries with higher shareholders' protection, but lower levels of contract enforcement prefer sustainable syndicated deals vis-à-vis conventional syndicated funding. Finally, the environmental policy stringency of a country increases the probability of a firm choosing a sustainable deal.

This paper is organized as follows. Section 2 reviews the literature and describes the research hypotheses. Section 3 describes the data and variables we use in our tests. In section 4, we examine the determinants of sustainable *vis-à-vis* conventional syndicated loan spreads. It also analyzes if the market prices loans differently across sustainable and comparable traditional syndicated loans. Section 5 examines which factors influence the choice between sustainable *versus* conventional syndicated deals. Section 6 presents the main conclusions of this study.

2. Literature review and hypotheses

2.1. The financial economics of sustainable loans

Koninklijke Philips closed the world's first sustainable loan in 2017, a €1 billion syndicated loan with an interest rate linked to sustainability performance and rating. Since then, sustainable loans have been quickly growing and expanding. In our sample, the first sustainable loan was closed by the American firm CMS Energy Corp., in June 2018, with a tranche size of $551 million and a 5-year maturity. The largest issuance, with a similar maturity and a tranche size of $10 billion, was closed in 2022 by Ford Motor Company, to finance projects to improve the firm's sustainability goals, namely 'to invest in clean transportation projects, including investments in Ford's electric vehicle lineup'. Over the last few years, the

syndicated loan market has financed a broad range of project types, tranche sizes, and maturities. However, what are the main characteristics of sustainable loans that make them different from traditional ones?

As a typical syndicated loan deal, sustainable syndicated loans are pyramids with a few arranging banks (arrangers) at the top and many providing banks (providers) at the bottom.[6] In this paper, as we want to compare such assets with conventional syndicated loans, we focus on standard sustainable syndicated loans, which consist of a standard recourse-to-the-borrower debt obligation aligned with the ESG principles. Therefore, standard sustainable loans have recourse to the borrower's entire balance sheet, and not only to the ESG project's risk being implemented as, for example, in sustainable project finance loans.[7] Sustainable loans can be segmented into three typologies. Green loans are instruments made available for the purposes of financing a 'green project' (e.g., projects that foster a net-zero emissions economy, protect and restore the environment, and facilitate adaptation to climate change). Social loans are extended to projects with a primary objective of inducing social benefits or the achievement of positive social outcomes (e.g., affordable basic infrastructure, access to essential services, affordable housing, employment generation, and food security and sustainable food systems). Sustainability-linked loans are used for general business purposes, with the terms tied to the borrowers' ESG-related performance, measured via key performance indicators (KPIs) and sustainability performance targets (SPTs).

Sustainable loans are debt instruments issued by corporations, municipalities, governments, and supranationals with two distinguishing features. First, proceeds are used for ESG projects. Second, they should fulfil sustainable loan principles: the Green Loan Principles (GLP), the Sustainability Linked Loan Principles (SLLP), and the Social Loan Principles (SLP).[8] Therefore, borrowers must appoint an external

[6] Syndicated loans can be tranched into heterogeneous loans, usually distributed across lenders with different risk aversion. See Dennis and Mullineaux (2000), Esty and Megginson (2003), and Maskara (2010) for an in-depth analysis of syndicated loans; and Du *et al.* (2023) for sustainability-linked loans.

[7] As sustainable project finance syndicated loans fund a specific project implemented via a standalone entity, characterized by having relatively larger amounts of non-recourse (or limited recourse) debt, the investor is exposed to the risk of the project (e.g., Corielli *et al.*, 2010; Pinto and Santos, 2020).

[8] The GLP and SLP aim to promote the development of the green and social projects, respectively, based on four central components: (*i*) use of proceeds; (*ii*) process for project evaluation and selection; (*iii*) management of proceeds; and (*iv*) reporting. The SLLP are based around the following core components: (*i*) selection of KPIs; (*ii*) calibration of SPTs; (*iii*) loan characteristics; (*iv*) reporting; and (*v*) verification.

review provider to assess the alignment of their loans or, as the loan market is traditionally a relationship-driven market, develop the internal expertise to confirm alignment with the principles (self-certification). Complying with the sustainable loan principles may require substantial managerial effort and resources, which is costly to the borrower, namely for first-time borrowers (Caramichael and Rapp, 2022).[9]

Sustainable loans in general, and especially sustainability-linked loans, are contractual innovations that intend to tie a loan's interest rate to the borrower's ESG performance indicators. Extant literature on performance pricing, which focuses on the analysis of contract design features that link a loan's interest rate to borrower's credit quality, highlights the importance of performance sensitive debt in mitigating agency costs and enhancing contract completeness (e.g., Asquith *et al.*, 2005; Roberts and Sufi, 2009; Costello and Wittenberg-Moerman, 2011; Christensen *et al.*, 2021). As mentioned by Flammer (2021) and Loumioti and Serafeim (2023), sustainability-linked pricing adjustments may be used by lenders to discipline borrowers' ESG activities and mitigate risks.

Due to the specific characteristics of sustainable loans, in particular that they are set up in accordance with specific sets of rules regarding their use of proceeds, and impact measurement, reporting, and verification, being (theoretically) assigned for certain sustainability-linked or ESG-aligned projects, assets, or activities (Schumacher, 2020); and their pricing is usually conditional on environmental, social and governance related risks (Chava, 2014), one would expect that sustainable and conventional syndicated loans are differently priced by common pricing factors and banks rely more on other factors than credit ratings when pricing sustainable syndicated loans. Therefore, we raise the hypothesis:

Hypothesis 1 (H1): Sustainable and conventional loans are influenced differently by common pricing factors.

2.2. Spreads across syndicated loan classes

[9] Whilst each of the GLP, SLLP, and SLP make suggestions on where focus should be paid, the absence of any market standard document allows the parties to decide if a loan is consistent with the principles. The main objective is to warn of the issue of 'green/sustainability/social washing' where a loan's green, sustainability-linked, or social features are exaggerated.

The previous literature that compares spreads and pricing of sustainable *vis-à-vis* conventional debt instruments focuses almost exclusively on green bonds and on the analysis of the existence of a negative yield spread - 'greenium' - and on its determinants. Extant theoretical literature mostly argues that green bonds should be issued at a premium over comparable corporate bonds. According to Fama (2021), if investors value the ESG actions of firms, investment decisions that consider ESG criteria will be rewarded via higher share prices and lower costs of capital. Therefore, if investors have a "taste" for holding sustainable bonds, they will be priced at a premium compared to traditional corporate bonds (Fama and French, 2007). In addition, green bonds may reduce asymmetric information problems, namely when heterogeneous investors have different private information and different capabilities to screen firms, via 'green' certification and third-party reviews (Yu, 2005; Gao and Schmittmann, 2022);[10] and can work as a hedging mechanism against climate risks (Pedersen *et al.*, 2021; Pástor *et al.*, 2021).

Empirically, extant literature presents contradictory evidence, depending on samples and periods analysed, as well as on the type of market (primary or secondary), and different issuers (e.g., Ehlers and Packer, 2017; Baker *et al.*, 2018; Hachenberg and Schiereck, 2018; Bachelet *et al.*, 2019; Zerbib, 2019; Larcker and Watts, 2020). Considering the corporate bond market, although Tang and Zhang (2020) and Flammer (2021) find that the yields of green *versus* brown bonds do not differ significantly; several studies find a negative yield spread, which can range from 8 bps (Caramichael and Rapp, 2022), through 22 bps (Fatica *et al.*, 2021), to 33 bps (Wang *et al.*, 2020) in the primary market. Löffler *et al.* (2021) also provide evidence of a 15-20 bps "greenium" in the secondary markets.

By following sustainable loan principles (SLLP, GLP or SLP) borrowers and lenders are increasing transparency and disclosure and seeking to support the integrity of the loan. The proceeds of a sustainable loan should be credited to a dedicated account or otherwise tracked by the borrower in an appropriate manner. In addition, by having borrowers report on the use of sustainable loan proceeds (e.g., the amounts

[10] Gao and Schmittmann (2022) present a model of the corporate green bond market under asymmetric information without a green preference, and show that green bonds have a price premium over conventional bonds when there is information asymmetry, transition risk, and it is costly to engage in greenwashing.

allocated and their expected/achieved impact), these principles promote a step change in transparency that facilitates the tracking of funds to sustainable projects or sustainable-linked actions.[11] Therefore, sustainable loan principles contribute to asymmetric information and agency cost mitigation between lenders and borrowers; i.e., companies reduce information asymmetries and uncertainties *vis-à-vis* their capital providers and thus reduce their cost of capital, in line with the arguments of Diamond and Verrecchia (1991) and Lambert et al. (2007). In the case of sustainability-linked loans, the loan economic cost is linked to whether the selected predefined SPTs are met. According to Loumioti and Serafeim (2023), by including sustainability pricing adjustments, lenders can alleviate moral hazard and adverse selection costs with respect to borrowers' ESG activities. Hence, we would expect lower spreads for sustainable loans.

In addition, Central banks and supervision authorities have also started analyzing the impacts of climate change on banks' portfolios and the stability of the financial system (Palea and Drogo, 2020; Nguyen et al., 2023), including encouraging banks to measure and disclose their exposures to climate-related risks through stress tests. Therefore, we would expect syndicated loans that meet the GLP, SLLP, or SLP, to have lower spreads *vis-à-vis* comparable traditional loans, as they consume less capital from the lending banks (e.g., higher polluters would be charged an additional carbon risk premium for the higher uncertainty associated with the transition to a low-carbon economy, which may affect their future cash flows). Conversely, banks are sensitive to the ESG profile of a firm because of the potential for regulatory, compliance, and litigation risk for the borrower, which can lead to higher credit risk (Chava, 2014). Therefore, banks demand higher loan spreads in anticipation of the potential risks they face in debt contracting (Bharath et al., 2008; Graham et al., 2008).[12]

[11] According to the SLLP, in the case of sustainability-linked loans, 'borrowers are encouraged to position this information within the context of their overarching objectives, sustainability strategy, policy, sustainability commitments and/or processes relating to sustainability.' The KPIs must be relevant, measurable or quantifiable, and able to be benchmarked.

[12] Moreover, a considerable number of banks, representing approximately 80% of the global lending volume, have adopted the Equator Principles and are signatories to the United Nations Environment Programme's Statement by Banks; and many large, publicly traded banks across the world have started to incorporate ESG concerns in their lending decisions (e.g., Dasgupta *et al.*, 2002; Delis *et al.*, 2018; Del Gaudio *et al.*, 2022).

Finally, several works (Goss and Roberts, 2011; Hasan *et al.*, 2017; Ehlers *et al.*, 2022; Ho and Wong, 2023; Correa *et al.*, 2023; Degryse *et al.*, 2023) have focused on whether different ESG characteristics of a borrower could affect the cost of borrowing in the syndicated loan market. Authors find that firms with strong sustainability scores face lower spreads (Chava, 2014; Hasan *et al.*, 2017), and provide empirical evidence of a significant negative relation between voluntary disclose of their carbon emissions and loan spreads (Kleimeier and Viehs, 2018). Similarly, Javadi and Al Masum (2021) show that firms face higher spreads in regions with higher exposure to climate change, while Nguyen *et al.* (2021) show that US mortgage lenders charge higher interest rates for mortgages on properties exposed to a greater risk of sea level rise and that this difference is higher for long-term loans. Extant literature also shows that banks start to consider climate transition risk in the pricing of loans after the 2015 Paris Agreement (Delis *et al.*, 2018; Reghezza *et al.*, 2021; Ehlers *et al.*, 2022; Ho and Wong, 2023; Degryse *et al.*, 2023). Consequently, if we expect that firms with better ESG performance are those that use the sustainable loans market (Loumioti and Serafeim, 2023), we would also expect them to benefit from a lower credit spread.

Under this framework, we raise a second hypothesis:

Hypothesis 2 [H2]: Sustainable and conventional syndicated loans spreads differ significantly, and sustainable loans have lower spreads than comparable traditional syndicated loans.

2.3. The cost of funding motivation

Extant literature presents several motivations for corporates using sustainable *vis-à-vis* traditional debt financing, namely: (*i*) signaling motivation, as sustainable debt can be seen as a credible signal of the firm's commitment towards sustainability (Lyon and Maxwell, 2011; Loumioti and Serafeim, 2023; Kim *et al.*, 2023);[13] (*ii*) liquidity motivation, as sustainable debt can increase liquidity for an issuer's assets (Flammer, 2021; Tang and Zhang, 2020); (*iii*) greenwashing motivation, meaning the practice of making unsubstantiated or misleading claims about the company's environmental commitment via using selective disclosure and

[13] In this line of reasoning, extant literature provides evidence that the stock market responds positively to companies' eco-friendly behaviour (Klassen and McLaughlin, 1996; Flammer, 2013,2021; Krueger, 2015; Tang and Zhang, 2020; Wang *et al.*,/ 2020).

misleading narratives (Lyon and Montgomery, 2015; Marquis *et al.*, 2016; Carrizosa and Ghosh, 2023); and (*iv*) cost of capital motivation, as sustainable debt may reduce the cost of financing (Fama, 2021; Pedersen *et al.*, 2021; Pástor *et al.*, 2021; Gao and Schmittmann, 2022). There is also evidence consistent with contractual - cost and size - and borrower - board gender diversity, liquidity, profitability, and debt structure - characteristics, as well as investors' green preferences affecting firms' financing decisions between green and conventional bonds (Cicchiello *et al.*, 2022; Lin and Su, 2022).

Concerning syndicated loans, Ioannou and Serafeim (2019) argue that borrowers have incentives to contract on sustainable syndicated loans to signal their ESG reputation, while lenders may target low-ESG risk borrowers to mitigate monitoring costs and reputational risks. In this line of thought, Loumioti and Serafeim (2023) show that sustainability-linked loans are more prevalent among low ESG risk borrowers. The authors do not find a significant relation between borrowers' ESG risk and sustainability KPI materiality and tightness, which is in line with the view that sustainability-linked loans are unlikely to drive ESG performance improvements. These results contrast with those of Dursun-de Neef *et al.* (2023), Kim *et al.* (2023), Carrizosa and Ghosh (2022), Du et al. (2022), which find evidence of borrowers' performance increase in sustainability issues following the closing of sustainability-linked loans, namely to borrowers with a strong commitment to sustainability practices and to lenders that aim to enhance their reputation.

Concerning the cost of capital motivation, the focus of this paper, empirical evidence for sustainable loan deals is scant and presents mixed results. Despite Du *et al.* (2023) and Kim *et al.* (2023) focusing mainly on the impact of sustainability-linked loans closing on borrowers' ex-post ESG performance,[14] authors also examine if there is a pricing incentive for firms to use sustainable loans *vis-à-vis* comparable conventional loans. Authors find that sustainability-linked loan spreads do not differ from non-sustainable loans. On the contrary, Kim *et al.* (2023) show that green loans are issued with a 'greenium'.

[14] Kim *et al.* (2023) show that borrowers' ESG performance increases following sustainability-linked loans closing, namely among borrowers with a strong commitment to sustainability practices. Du *et al.* (2023) document that such loan instruments are primarily beneficial to lenders that aim to enhance their reputation.

Underlying the cost of capital motivation for firms using sustainable debt funding (Fama, 2021; Pedersen *et al.*, 2021; Pástor *et al.*, 2021; Gao and Schmittmann, 2022), we propose the following hypothesis:

Hypothesis 3 [H3]: Firms use sustainable syndicated deals to reduce their borrowing costs.

3. Data and variable definition

3.1. Sample selection

Our sample consists of individual loans extracted from Loan Analytics, which provides comprehensive coverage of the global syndicated loan market (Ehlers, 2022), and covers the 2018-2022 period. For all sustainable loans in the database, Loan Analytics assigns three market segment flags corresponding to SLLP for those that comply with the Sustainability Linked Loan Principles, GLP for those that comply with the Green Loan Principles, and SLP for those that comply with the Social Loan Principles.[15] The remaining syndicated loans were classified as conventional loans. Following Carey and Nini's (2007) approach, to reduce the problem of unmeasured credit quality correlated with nationality, pricing and firms' choice determinants are examined based on a sample including only deals closed in OECD countries. To have a more comparable sample and to avoid selection bias problems, we selected only conventional loans for which the borrower industry and country have at least one record of sustainable loan issuance. We also require that loan tranches have available information on tranche and transaction size, and concentrate on loans identified as having the purpose of financing new investments or projects. We exclude loans made for project finance transactions as they are extended to newly incorporated special purpose entities. As the longest maturity for sustainable loans is 20 years, we eliminated conventional loans with a maturity of more than 20 years, and excluded all tranches that were cancelled within 30 days post-issuance.

As the unit of observation is a single tranche, multiple tranches from the same deal appear as separate observations in our database. Therefore, we aggregate tranche-level data (e.g., spread, maturity, and rating) to perform a deal-level analysis in section 5. To do this, we required that the primary purpose of each loan is the same for each specific deal, and that the sum of all loans in the package equals the deal amount.

[15] A facility cannot be labelled as green/social if it includes a green/social and non-green/non-social tranche(s); the green/social label applies only to the tranche(s) aligned to the GLP/SLP. We also check with Dealscan database that the classification made by Loan Analytics is correct. In general, the loans classified as sustainable are the same in both databases.

As we wish to analyze how spreads and pricing processes on sustainable loans compare with those of comparable conventional loans, we select from our full sample those issues that have the necessary information to compute the spread. Borrowers' credit rating was extracted from Datastream. As Loan Analytics and Datastream do not have a common identification code, we hand-match borrowers' names. In addition, to take possible outliers into account, we winsorize the data for transaction size, maturity, and spread at the 1% and the 99% levels. Finally, Data on macro variables, such as market volatility and slope of the yield curve, were obtained from Datastream.

These screens yield a sample of 24,962 syndicated loans (16,759 deals) worth €11,555.1 billion, of which 712 tranches (430 deals) worth €527.8 billion are classified as sustainable loans (581 sustainability-linked loans, 119 green loans, and 12 social loans) and 24,250 tranches (16,329 deals) worth €11,027.3 billion as conventional loans. Panel A of Table 1 presents the distribution of loans per year, while Panel B and Panel C present the industrial distribution and the loan allocation to borrowers in a particular country. Panel A shows that while conventional loans showed stability in the amounts closed over the sample period, sustainable loans saw a sharp increase in the years 2021 and 2022, particularly for sustainability-linked loans. Panel B reveals striking similarities between sustainable and conventional loan issuance: they are concentrated in two regions, with issuers located in the US and Western Europe accounting for 92.7% and 94.9%, respectively. Perhaps the most remarkable difference is how frequently conventional loans, in our sample, are extended to projects in the North America. Panel B reveals that sustainable loans are concentrated in three key industries; i.e., real estate (18.7%), utilities (12.6%), and computers and electronics (12.4%) account for 44.1% of all sustainable loan issuance by volume. Conventional loan issuance reveals a far less concentrated industrial pattern, with borrowers in computers and electronics (12.9%), finance and insurance (12.1%), and healthcare (9.2%) industries receiving the higher percentages.

****** Insert Table 1 about here ******

Panel D provides information in relation to identifying the biggest players and their relative importance in syndicated loan markets, while Panel D ranks the top 10 switching firms, those that close both sustainable and conventional loans in the sampling period, by value and number of deals. The top 10 sustainable and conventional borrowers contributed to a significantly different weight, by value of deals: while the top 10 sustainable loan borrowers issue 21.1% of all tranches in our sample, the top 10 conventional loan issuers are responsible for only

4.6% of all loan issuance in OECD. Interestingly, none of the firms that are in the top 10 for sustainable loans are in the ranking for conventional loans. Panel D shows that the top 10 sustainable and conventional loan switchers contribute to a weight of 29.0% and 38.9% of all issuance by volume, respectively. It is interesting to note that only 4 borrowers (Ford Motor, Pfizer, Dell, and Crown Castle International) are in the top 10 for both loan types.

3.2. Dependent and independent variables

Table 2 provides detailed definitions and sources for all the variables used, as well as the expected impact of explanatory variables on loan spreads.

****** Insert Table 2 about here ******

3.2.1. Spread

The *spread* corresponds to the price for the risk associated with the loan at closing, defined as the tranche all-in-pricing above Libor or Euribor. It is the interest rate that the borrower pays to the lender on the amount drawn on the loan, measured as a markup over a benchmark.[16] Loans differ in the currency in which they are denominated, raising the possibility that expectations about exchange rate movements might drive differences in loan spreads across markets. We address this problem by converting contract spreads into dollar-equivalent spreads using, as proposed by Carey and Nini (2007), forward exchange rates as of the loan contract signing date. For syndicated loans, the spread does not represent the full economic cost of credit, as there are, typically, several tranches funding a deal. We test the robustness of our results by aggregating tranches at the deal level and computing the *weighted average spread (WAS)* as the weighted average between the loan spread and its weight in the deal size.

3.2.2. Core independent variables

Recent empirical studies indicate that several contractual factors convey information about the pricing of loans and bonds (e.g., Carey and Nini 2007; Chen *et al.* 2007; Qian and Strahan 2007; Bae and Goyal 2009; Maskara 2010; Bharath *et al.* 2011; Lin *et al.* 2011; Lim *et al.* 2014; Alves *et al.* 2021). These include credit rating, deal size, currency risk, loan and interest rate type, and fees.

[16] According to Loan Analytics, the tranche all-in pricing 'measures how much a borrower has had to pay out to the banks for the loan at the tranche level […] it also considers the fees as well as the margin.'

We begin by addressing the core independent variables. In order to test hypothesis H2, we use an indicator variable that takes the value one for *sustainable* loans, those that comply with SLLP, GLP or SLP, and expect that sustainable loans have lower spreads than comparable traditional syndicated loans. To investigate the term structure of spreads, we include loan *maturity* and the logarithm of maturity (*log maturity*) as explanatory variables. It is widely agreed that borrowers usually demand higher premiums for longer-term securities. Credit ratings are a central determinant of bond and loan spreads. As the information on loan ratings provided by Loan Analytics is not available for several tranches, we include the dummy variable *rated*, equal to 1 if the loan has a credit rating from Fitch, Moody's and/or S&P, and 0 otherwise. For those tranches with at least one credit rating assigned by Fitch, Moody's and/or S&P, we converted credit ratings as follows: AAA=Aaa=1, AA+=Aa1=2, and similarly until D=24. If a tranche has two or three credit ratings, we computed the average. Rating scales are inverse scales, so we expect spreads to increase as the rating decreases. We also use firms' credit ratings to capture the borrowers' likelihood of fully meeting their financial obligations as they come due. As for loan tranches, we use *rated borrower* and *borrower rating* as additional core variables. We expect that rated loans/borrowers to face lower spreads, and the higher the rating, the higher the tranche spread.

3.2.3. Contractual controls

The deal size is, *ceteris paribus*, positively related to lower uncertainty and higher liquidity than smaller offerings (Kleimeier and Megginson 2000; Chen *et al.* 2007; Bae and Goyal 2009; Ivashina and Kovner 2011). We thus expect a negative impact of *transaction size* on spread.

The syndicate deal structure is layered so that each position benefits from the credit protection of all the positions subordinated to it. As in Maskara (2010) and Cumming *et al.* (2020) we use the *number of tranches* to measure a syndicated loan deal's tranching and expect a negative impact on the spread. We expect tranches exposed to *currency risk* to have higher spreads than those that are not (Kleimeier and Megginson 2000). On the contrary, we expect companies that have already closed a syndicated loan deal before – experienced –, whether sustainable or conventional, as well as those that close both types of financing – switchers –, to face a lower spread because there are significant fixed costs associated with establishing a first syndicated deal, namely if it is a sustainable loan deal.

Colla *et al.* (2012) find that seniority is reflected in pricing; i.e., the differential between junior and senior spreads is influenced by the relative mix of senior to junior debt. We use the *subordinated* dummy variable to control for differences in risk existing among different tranches of a deal. We expect subordinated loans to have higher spreads than senior loans. Finally, we control for the following dummy variables: *term loan* and *fee information* (Lin *et al.* 2011).[17] We expect to observe a significant and positive relationship between these variables with spread.

3.2.4. Syndicate structure

Literature concerned with the topic of relationship banking argues that repeated borrowing from the same lender reduces information asymmetries about the borrowing firms' characteristics, therefore affecting the terms of financing (Boot 2000; Sufi 2007). Dahiya *et al.* (2003), Bharath *et al.* (2007, 2011), Ivashina (2009), and Alexandre *et al.* (2014) find that relationship banking positively affects lending terms. As bank relationships mitigate deadweight costs of asymmetric information, we expect a negative relationship between a *former lender* and loan spreads.

Esty and Megginson (2003) argue that smaller and more concentrated syndicates have better monitoring incentives and greater re-contracting abilities. The syndicate size is proxied by the *number of lenders* in a deal syndicate and, as syndication may improve risk sharing, we expect a negative impact on spreads. Additionally, Bae and Goyal (2009) find for non-U.S. borrowers, that foreign participants in loan syndicates increase spreads. On the contrary, foreign bank participation in loans extended to U.S. borrowers is associated with greater competitive pressures during the bidding process, which reduces spreads. We examine this impact by including a dummy control for domestic lead banks (*versus* foreign lead banks). To capture additional differences in bank syndicates, we also control for *bank reputation* in the overall syndicated loan market, computed according to the yearly Thomson Reuters mandated arrangers' ranks (Alves *et al.* 2021). Similarly, we also control for bank reputation in the sustainable syndicated loan by

[17] A term loan tranche is a loan facility for a specified amount, fixed repayment schedule and maturity, and is usually fully funded at origination. A credit line or revolver facility have shorter maturities than term loans and are drawn down at the discretion of the borrower (Lim *et al.* 2014).

controlling for Bank ESG reputation. As the involvement of lead banks with a higher reputation may reduce information asymmetries, we expect a negative relationship between lead bank reputation and spreads.

3.2.5. Macroeconomic controls

We control for other country-level variables, such as S&P's country rating to control for sovereign risk, and the environmental policy stringency (EPS) measure per country. In robustness checks we also control for the *country ESG rating*, proxied by the Vigeo's country ESG rating at closing, and by environmental performance index ranks – *EPI ranking*. In addition, to control for structural differences across industries, we use the following dummy variables: *high carbon* and *capital intensive* (Alves *et al.* 2021; Ehlers *et al.* 2022).

As banks have comparative advantages in mitigating asymmetric information problems by monitoring borrowers more closely and are able to enforce contracts without judicial assistance by exercising contractual covenants, we expect the type of financial system – market-based or bank-based – to influence the pricing of loans. Qian and Strahan (2007), Bae and Goyal (2009), and Lin *et al.* (2011) offer evidence that stronger creditor rights result in loans with lower spreads. Considering that bankruptcy laws define who controls the insolvency process and has rights to the property of a bankrupt firm, and with what priority, we expect stronger *creditor rights*, proxied by Djankov *et al.*'s (2007) creditor rights index, to decrease loan spreads. We use the *antidirector rights* index (La Porta *et al.* 1998; Spamann 2010) as a measure of shareholder protection and expect that stronger laws governing shareholder rights increase loan spreads. Finally, Bay and Goyal (2009) show that enforceability matters for loan contracting, and not merely the existence of creditor rights. Our measure of enforcement efficiency comes from La Porta *et al.* (1998) and we expect that loans extended to countries with superior *enforcement* have lower spreads.

Finally, we control for additional macroeconomic factors such as the term structure of interest rates, *5YrTB-3mTB*, calculated as the difference between the 5-year and 3-month U.S. T-bill rate at the deal closing date, and market *volatility*, measured by the Chicago Board Options Exchange Volatility Index.

3.3. Financial characteristics of sustainable versus conventional loans

We describe the sample, by loan typology, in Table 3. This section constitutes the most exhaustive such comparison in the literature. Table 3 also presents Wilcoxon's z-tests and Fisher's exact tests comparing the values

of each variable in the sustainable loan subsample with the corresponding values in the conventional loan subsample. Almost all of the pair-wise comparisons indicate statistically significant differences between the common pricing variables associated with the two subsamples.

****** Insert Table 3 about here ******

Regarding the relative pricing of sustainable loans *versus* conventional loans, Table 3 shows that the average spread is economically and statistically higher for conventional loans (280.5 bps) than it is for sustainable loans (198.3 bps). A conventional loan of average size matures in 4.7 years, which is a short period if we compare it with the average of 5.1 for sustainable loans. Average credit ratings for conventional loans (12.6 | BB-) are significantly worse than for sustainable loans (10.9 | BB+). As expected, similar results are obtained when comparing the borrower's credit rating between these two loan categories.

The average transaction size exhibited by conventional loan deals is lower than the average transaction size exhibited by sustainable loan deals. This can be explained by the higher transaction costs involved in the structuring of a sustainable deal *vis-à-vis* conventional deals as borrowers must appoint an external review provider to assess the alignment of their loans or develop the internal expertise to confirm alignment with the sustainable loan principles. A significantly larger number of tranches per transaction is issued in a sustainable loan deal: in a typical conventional loan deal, the average number of tranches per transaction is 1.9, which is smaller than the average of 2.4 for sustainable ones. In addition, the average number of banks participating in sustainable loan issuances is 10.7 and is significantly larger than the average of 6.4 for conventional loan deals. This finding suggests that underwriting banks wish to increase the tranching level and the number of institutions participating in a sustainable loan issuance of a given size in order to spread risks over a larger number of banks. Finally, we find that the level of bank reputation is stronger for sustainable loans *versus* conventional ones.

The dummy variables detailed in Table 3 clearly suggest that sustainable and conventional loans are fundamentally different financial instruments. Sustainable loan tranches are more frequently issued with and by a borrower with a credit rating from Fitch/Moody's/S&P, than conventional loans. Sustainable loans are much more likely to be closed by experienced borrowers (65.0% *versus* 56.1%) and switchers (58.9% *versus* 2.9%) and be subject to currency risk (16.9% *versus* 7.1%) than conventional loans. While about 1.8% of conventional loans are

subordinated, these loans are only 0.3% of sustainable loans closed in the sampling period. Additionally, a significantly small fraction of sustainable loans are arranged by a domestic lead bank (85.8%) compared to the sub-sample of conventional loans (90.7%); and sustainable loans verify a higher fraction of tranches provided by a former lender (55.1% *versus* 42.0%). Finally, the two loan categories do not differ significantly in terms of fee information and being classified as term loans.

Our results indicate that the common pricing characteristics differ significantly in value between sustainable and conventional loan tranches. Therefore, we would expect the impact on pricing to be loan-specific.

4. The pricing of sustainable *versus* conventional loans

4.1. Determinants of sustainable and conventional loan spreads

To examine the common pricing determinants of individual sustainable and conventional loans, we follow an instrumental variable approach to address maturity and spreads being jointly determined, as both spread and maturity are determined simultaneously once negotiations for the financial package begin. We confirm that maturity is endogenous by estimating the Durbin-Wu-Hausman chi-squared test. We reject the null hypothesis that maturity is exogenous to spread as we obtain a chi-squared test statistic of 432.12 (*p*-value = 0.000). We use the model described in equation (1).[18] The dependent variable is the *spread*, in basis points. We employ GMM regression techniques and use the tranche size and if the loan is tranched as instruments for maturity. The 2008 financial crisis and the subsequent European sovereign debt crisis manifested a shortage of liquidity, which was reflected in a maturity reduction for loans. In addition, the Covid-19 pandemic as well as the recent rise in interest rates as a response to the significant increase in OECD countries' inflation rate, constrained bank funding particularly for longer periods. Therefore, it is plausible to associate maturity with both tranche size and if the loan is tranched for syndicated loans. Larger tranches might imply lower maturities since they constitute a larger share in lenders' loan portfolio. In addition, according to DeMarzo (2005) and Alves et al. (2021), tranching increases loans' maturity by

[18] We use a reduced-form model along the lines of existing pricing models for corporate bonds (e.g., Campbell and Taksler 2003; Chen *et al.* 2007; Marques and Pinto 2020) and loans (Carey and Nini 2007; Qian and Strahan 2007; Daniels and Ramirez 2008; Bae and Goyal 2009; Bharath *et al.* 2011; Lin *et al.* 2011; Lim *et al.* 2014).

reducing the deadweight costs of asymmetric information. Due to time-varying risk premia and as our analysis is conducted by tranches, we estimate standard errors clustered by year and deal, and estimate a regression of the following form:

$$\begin{aligned} Spread_{i,t} = \alpha_0 + \beta_1 Sustainable_{i,t} + \beta_2 Maturity_{i,t} + \beta_3 \text{Log}\, maturity + \beta_4 Rated_{i,t} \\ + \beta_5 Tranche\ rating * Rated_{i,t} + \gamma\ Contractual\ controls_{i,t} \\ + \delta\ Syndicate\ structure_{i,t} + \varphi\ Macroeconomic\ Controls_t + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where the subscripts refer to loan *i* at time *t*.

A Chow test for a structural break is used to examine whether the spreads associated with sustainable and conventional loans are influenced differently by common pricing characteristics. In essence, we are testing whether the pricing characteristics used in equation (1) are significant in both sustainable and conventional tranches and, if so, whether they have the same coefficient values. We conclude that sustainable and conventional tranches are distinct financial instruments and that they are financial instruments influenced differently by common pricing characteristics because of the Chow test statistic of 44.1 (83.6 if we compare sustainability-linked loans with conventional loans; 35.1 if we compare green loans with conventional loans; and 22.5 if we compare social loans with conventional loans), which is higher than the critical level. Hence, we corroborate H1 and examine, in section 4.2., the determinants of spreads for each loan instrument separately.

We start our analysis by comparing spreads among securities. Results presented in columns 1 and 2 of Table 4, for the samples discussed in section 3.3., suggest that sustainable loan spreads do not differ significantly from those of conventional loans. Considering that in our sample only 44.9% of loans have a credit rating, which is a key pricing factor, in Models [3] and [4] we re-estimate the previous models by including rated loans only, and the coefficient of the *sustainable* variable remains statistically insignificant. In previous models, the *sustainable* dummy may suffer from endogeneity, due to the lack of plausibly exogenous variation in the choice between sustainable and conventional loans. Second, in the full sample, sustainable loans are about 3% of the total sample. As suggested by Roberts and Whited (2013) and following a methodology similar to Flammer (2021), we re-estimated model [1] for a matched sample. We proceed as follows. We match each sustainable loan to the most comparable conventional loan by using a PSM approach (loan-level PSM), by creating a 1 to 1 matching algorithm that captures the most identical conventional loan issued by the same firm in the same year, using the following

characteristics: rating, loan size, and maturity. After applying this procedure, we end with a sample of 417 sustainable loans and a quasi-identical loan-level matched sample of 417 conventional loans. By design, this matching procedure provides for each sustainable loan a matched conventional loan issued by the same firm that is as similar as possible except for the fact that the sustainable loan is issued to fund an ESG-linked activity.

****** Insert Table 4 about here ******

Results presented in column 5 of Table 4 show, again, that the sustainable loan spread does not differ significantly from that of matched conventional loans. Similar results are obtained in models [6] and [7] when re-estimating model [2] including loans extended to borrowers in capital intensive industries (model [6]) or high carbon industries (model [7]) only.[19] These results are contrary to the arguments of sustainable finance theoretical literature (Fama, 2021; Pedersen et al., 2021; Pástor et al., 2021; Gao and Schmittmann, 2022). Therefore, thus far and considering the three sustainable loan categories together in the same sample, we do not corroborate H2. We will analyze this further in the next section when using endogenous switching regression models and computing average treatment effects.

We perform a variety of econometric tests to assess the relevance and validity of our instruments. These tests and their results are presented at the bottom of Table 4. We implement GMM regression techniques and use the tranche size and if the loan is tranched as instruments for maturity. To test if our instruments are relevant, we conduct Anderson's LR test of the null hypothesis that correlations between instruments and the endogenous variable are essentially zero. We reject the null hypothesis for all the models presented in Table 4, implying that the instruments are strongly correlated with maturity. We also estimate Hansen's *J*-statistic for over-identification restrictions. The reported statistics indicate that the over-identifying restrictions are not rejected, which provides support to the exogeneity of the tranche size and if the loan is tranched. We can thus conclude that our instruments are relevant and valid.

As presented in Table 1, the sample of sustainable loans is divided into 581 sustainability-linked loans, 119 green loans, and 12 social loans with available information on tranche/transaction size and spread. Table 5

[19] Similar results were obtained for a subsample of loans closed by switchers. Results are available from the authors upon request.

presents the results of re-estimating models in Table 4 in which the sustainable dummy is replaced by three dummy variables one for each sustainable loan category. Analysis of the table shows that for the full sample of loans (models [1a] and [2a]) sustainable-linked loans have higher spreads than conventional loans. On the contrary, green loans results seem to corroborate Kim *et al.* (2023) findings, since the coefficient of the green loan variable is negative and statistically significant. However, when we run these models for the subsamples of rated loans (models [3a] and [4a]) and, above all, for the matched sample (model [5a]), the coefficient loses statistical significance. For social loans, the results must be analyzed with great caution, as the sample is very small. The results also seem to show, focusing on the matched sample (model [5a]), that there is no difference in spreads between social loans and conventional loans. Similar results are obtained for subsamples of loans closed by borrowers in capital intensive and high carbon industries (models [6a] and [7a]).

4.2. Loan pricing and borrowing choice

Results in Table 3 show that sustainable and conventional loans have significantly different characteristics Therefore, the selection might be important in this context. Additionally, in our sample borrowers can choose between sustainable and conventional loan deals: borrowers that use both deals to fund their investment projects are responsible for 714 deals and about 60% of sustainable tranches are closed by such firms. Finally, Kim *et al.* (2023) provide evidence suggesting that borrowers and lenders facing greater stakeholder demand self-select into ESG loan contracts.

As the choice may be endogenous to spreads, we use an endogenous switching regression model (Lokshin and Sajaia, 2004) to study the pricing, taking into consideration the potential self-selection by firms between closing a sustainable loan *versus* a conventional loan. We perform a full information maximum likelihood (FIML) method on the credit spread samples of our model specifications - models [1] and [2] of Table 4 - simultaneously with a probit selection equation, where the choice between sustainable and conventional loans is a function of core, contractual, syndicate structure, and macro factors.[20] The empirical model consists of the following three equations:

[20] We implement an FIML method to simultaneously estimate binary and continuous parts of the model to yield consistent standard errors. For further analysis, see Lokshin and Sajaia (2004).

$$Spread\ sustainable\ loan_{i,t} = \alpha_0 + \beta\ Core\ variables_{i,t} + \gamma\ Contractual\ controls_{i,t} + \delta\ Syndicate\ structure_{i,t} + \varphi\ Macroeconomic\ Controls_t + \varepsilon_{i,t} \quad (2)$$

$$Spread\ conventional\ loan_{i,t} = \alpha_0 + \beta\ Core\ variables_{i,t} + \gamma\ Contractual\ controls_{i,t} + \delta\ Syndicate\ structure_{i,t} + \varphi\ Macroeconomic\ Controls_t + \varepsilon_{i,t} \quad (3)$$

$$I^*_{i,t} = \delta_0(Spread\ sustainable\ loan_{i,t} - Spread\ conventional\ loan_{i,t}) + \beta\ Core\ variables_{i,t} + \gamma\ Contractual\ controls_{i,t} + \delta\ Syndicate\ structure_{i,t} + \varphi\ Macroeconomic\ Controls_t + u_{i,t} \quad (4)$$

where the third equation models loan selection: if $I_i^* > 0$, then firm *i* issues a sustainable loan; otherwise, it issues a conventional one. We adjust for heteroscedasticity and due to time-varying risk premia and cross-country differences, we estimate standard errors clustered by year and country. Considering the Wald test statistics of independent equations presented in Table 6, we accept the hypothesis of equations being independent, meaning that the firms' choice between sustainable and conventional loans does not affect the pricing of such securities.

****** Insert Table 6 about here ******

To examine further if characteristically similar loan tranches, which differ by deal type, have different spreads, we computed the average treatment effect (ATE) for spreads of sustainable *versus* conventional loans. We used models [1] and [2] of Table 4 and obtained the correct standard errors (as we account for the errors in the selection equation) for the ATE through bootstrapping. We show, again, that sustainable loan spreads do not differ significantly from those of conventional loans.

Sustainability-linked loan spreads are subject to adjustment based on borrowers' ESG performance during the life of the loan. Therefore, a straightforward comparison of loan spreads at closing does not capture the effective cost of borrowing. As a final robustness check, we manually gather data on sustainability rate adjustments from the Loan Analytics database. Our findings suggest that potential discounts for ESG performance do not appear to provide sufficient economic incentives as an average borrower could expect a maximum reduction of only six basis points on their all-in pricing.

Overall, our results do not corroborate H2: banks do not seem to be offering sustainable syndicated loans as a way of mitigating moral hazard and adverse selection costs with respect to borrowers' ESG activities; and banks are still not incorporating in loan pricing the potential benefits of implementing ESG-linked projects for borrowers' credit risk. However, our results are in line with those of Tang and Zhang (2020) and Flammer (2021),

which find that the yields of green *versus* brown bonds do not differ significantly and with those of Du *et al.* (2023) and Kim *et al.* (2023) for sustainability-linked loans. Contrary to Kim *et al.* (2023) we do not find evidence of a greenium effect when comparing green with nongreen syndicated loans.

Our results can be explained by two major factors. First, uncertainty and asymmetric information complicate pricing. Information on loan contracts, particularly for tranches with detailed information on the spread, is still very small. Second, market pricing is also hampered by a lack of consistent methodologies (e.g., opaque and unstructured methodologies make it hard for investors to extract information from ESG ratings), standardized metrics, and comparable disclosures (Eren *et al.* 2022). Given the recent introduction of sustainability-linked, green, and social loan financing, market players may be experimenting with identifying the most efficient contractual provisions and identifying the best way to compute the expected loss of a given sustainable loan.

With the increase in the volume of information on the market and with lenders becoming more sophisticated over time, increases in a borrower's sustainability performance may lead to a greenium in the syndicated loan market.

4.3. The pricing of sustainable vis-à-vis conventional loans

In Table 6 we find that borrowers' choice between sustainable and conventional loans does not affect the pricing process. In addition, we find that these two loan instruments are influenced differently by common pricing factors. Therefore, to study the pricing of sustainable loans we use equation (1) and estimate separate models for sustainable and conventional loans, using the samples presented in Table 3 – models [10] and [11] for conventional loans; models [12] and [13] for sustainable loans. Table 7 presents pricing regression results for a sample of 712 sustainable loan tranches and 24,250 conventional loan tranches.

****** Insert Table 7 about here ******

Contrary to what we expected, there is an insignificant relationship between spread and maturity for sustainable loans in models [12] and [13]. Contrary to what is presented by extant literature on the term structure of spreads in syndicated loans, which finds a positive relationship between spreads and maturity, we find a convex relationship, a "smile" effect, between spread and maturity for conventional loans. This result is in line with Alves *et al.* (2021) findings for a sample of syndicated loans for LBOs. Regarding the impact of credit risk on

spread, Table 7 shows that rated loans have higher spreads, and the higher the credit risk, the higher the spread for both sustainable and conventional loans. However, while the borrower's credit rating influences positively and significantly the loan spread for conventional loans, it does not affect significantly the spread of sustainable loans.

The influence of *transaction size* on spread is negative and significant for conventional loans, suggesting that increasing the transaction size of a conventional deal by €100 million will reduce the required spread by 36.6 bps in model [10]. Therefore, our results indicate a positive price liquidity effect related to the size of the conventional loan deal. On the contrary, the deal size does not affect sustainable loans' pricing. As expected, subordinated tranches have higher spreads, after adjusting for the other factors included in the regression. Contrary to what we expected, experienced borrowers face higher spreads for both samples. The *number of tranches* affects differently sustainable *versus* conventional loans: while there are benefits of tranching for conventional loans, we find an insignificant negative relationship with spreads for sustainable loans. Additionally, the influence of *currency risk*, *switcher*, *fee information*, and *term loan* variables is insignificant for both syndicated loan categories.

Regarding variables that reflect the syndicate structure, we find that bank relationships do not affect loan spreads in all models of Table 7. As expected, the spread and the *number of banks* are negatively and significantly related to sustainable loans. A larger number of banks involved may lower the spread because this may be associated with an increase in the certification of the transaction and thus mean that a higher number of banks will share default risk. However, this variable does not affect spreads for conventional loans. We find that if the syndicated deal is arranged by a domestic *versus* a foreign bank, it affects loan pricing for conventional loans only. Contrary to what we expected, *bank reputation* has a significant and positive impact on spreads for both sustainable and conventional loans. This result can be explained by the fact that most reputable banks might extract rents from the borrower and charge higher borrowing costs, as they provide a superior guarantee for the success of the deal and a greater capacity to hold those loans on-balance sheet.

The *country risk* behaves differently for sustainable loans than conventional loans. While the higher a country's credit risk, the higher the spreads paid by borrowers located in that country, there is an insignificant relationship between these two variables for sustainable loans. Surprisingly, the environmental policy stringency

index (EPS) does not affect loan spreads for sustainable securities (nor for conventional ones).[21] Similarly, the yield curve slope does not affect syndicated loan spreads. As expected, the impact of market volatility is positive and significant for both sustainable and conventional loans.

Results in models [12] and [13] show that variables capturing law and institutional characteristics do not affect the pricing of sustainable loans. Concerning conventional loans, only two variables affect spreads: (*i*) conventional loans extended to borrowers in market-based financial systems have higher spreads, holding other factors constant, than those extended to borrowers in bank-oriented countries; and (*ii*) the impact of the index of antidirector rights, which proxy for equity investor protection, is negative and significant. Therefore, our results are inconsistent with the emphasis on the importance of institutional and legal factors in determining sustainable loan spreads.

Overall, our results are in line with H1 by showing that sustainable and conventional loan tranches are priced differently by common pricing factors.

5. Loan issuance and firms' cost of borrowing: a deal-level analysis

In this section, we focus on the firms' cost of borrowing and the choice between sustainable and conventional syndicated deals. Our goal is to examine if firms use sustainable deals to reduce their cost of borrowing (H3). In addition, we examine which borrowing firms', contractual, and macro factors affect the choice process between sustainable and conventional debt. Our sample comprises deals that are divided into smaller loan tranches. Therefore, in this section, our descriptive and econometric analyses are based on the deals.

5.1. Deals' characteristics

As we have more than one loan tranche per deal, the cost of borrowing is determined by the combination of the different tranches' spreads. We use the weighted average spread (WAS), calculated as the sum of the product of the weight of each tranche in the transaction size and the tranche's credit spread, as a measure of the total cost of borrowing. Similar processes were implemented to compute other deal level variables, like the weighted average

[21] Similar results were obtained when we replace this variable per the country ESG rating, proxied by the Vigeo's country ESG rating at closing, or by environmental performance index ranks – EPI ranking.

maturity (WAM) and the weighted average rating (WAR). After aggregating loan tranches on a deal level, we identified 397 and 16,235 sustainable and conventional deals, respectively. Table 8 presents the characteristics of the sample of deals used. We find that the average WAS for sustainable deals is lower than that of conventional deals. In addition, as in our tranche-level analysis, we show that sustainable and conventional deals' characteristics differ significantly, as we reject the null hypothesis of variables in Table 8 being similarly distributed.

****** Insert Table 8 about here ******

5.2. Firms' cost of borrowing: sustainable versus conventional deals

We examine which one of the two financing transactions has the lowest borrowing cost by using equation (1). The dependent variable is now the WAS, and all independent variables are specified at the deal-level. Models [14] and [15] in Table 9 report estimates of this equation, using the samples presented in Table 8. The results suggest that, holding other factors constant, the WAS does not differ significantly between sustainable syndicated deals *vis-à-vis* conventional syndicated deals. Similar results are obtained when we re-estimate these models for a subsample of deals with information on credit rating – models [16] and [17] –; for a (deal-level) matched sample – model [18] –; and for subsamples of deals closed by firms in capital intensive industries – model [19] – or in high carbon industries – model [20]. We do not corroborate H3 as firms do not use sustainable syndicated deals to reduce their borrowing costs. Therefore, we do not find evidence corroborating the cost of capital motivation presented by Fama (2021), Pedersen *et al.* (2021), Pástor *et al.* (2021), and Gao and Schmittmann (2022).

****** Insert Table 9 about here ******

5.3. What factors affect firms' choice between sustainable and conventional deals?

As mentioned in section 2.1, sustainable deals are more restrictive and entail more transaction costs *vis-à-vis* conventional deals. These costs are related to the required assessment of the alignment of loans or the development of the internal expertise to confirm alignment with the sustainable loan principles. Therefore, sustainable deals' cost of borrowing should be higher than the one measured via the WAS, as the spread of a sustainable loan tranche does not include a set of additional fees that a conventional transaction does not have (Loumioti and Serafeim, 2023; Kim *et al.*, 2023). Considering that sustainable syndicated funding is equally or more expensive than conventional syndicated funding, other contractual, macroeconomic, and firm-level

countervailing benefits than borrowing costs should play a key role in the firms' choice process. We examine the factors affecting the choice process by using a logistic regression model. Our dependent variable, choice of debt, is a binary variable equal to 1 if the firm closes a sustainable deal and 0 if it closes a conventional deal.

$$Choice\ of\ debt_{i,t} = \alpha_0 + \beta_1 WAS_{i,t} + \omega\ Core\ variables_{i,t} + \gamma\ Contractual\ controls_{i,t} + \delta\ Syndicate\ structure_{i,t} + \varphi\ Macroeconomic\ Controls_t + \varepsilon_{i,t} \quad (5)$$

where the subscripts refer to deal *i* at time *t*. Coefficients were estimated based on heteroskedasticity-consistent standard errors clustered by year and deal. Furthermore, in Table 10, we report coefficients, rather than odds ratios (exponential coefficients) because our main interest is in the direction of the effects, instead of their magnitude.

****** Insert Table 10 about here ******

Table 10 reports the results of the logistic regression (5). Estimations were developed following the stepwise approach used in section 4.1.[22] Table 10 shows that WAM increases the probability of a firm choosing a sustainable deal, which is consistent with the prediction that by reducing the level of asymmetric information between lenders and borrowers, sustainable debt financing enables borrowers to raise funding with longer maturities (Flannery 1986; Diamond 1991). By fulfilling sustainable loan principles, borrowers mitigate adverse selection problems with respect to their ESG activities. This is also corroborated by a significant and positive relationship between variables *switcher* and *former lender* and the probability of observing a sustainable debt deal.

We find that sponsoring firms choose sustainable deals over conventional ones when issuing large amounts of debt due to issuance costs; i.e., sustainable loan financing is used for relatively large amounts of debt to economize on scale. Considering that compared to conventional syndicated loan financing, sustainable loans entail more transaction costs namely for first-time borrowers, firms choose sustainable deals for relatively large amounts of debt to capture expected economies of scale associated with borrowing contracting.

Findings also suggest that sustainable deals are extended to firms with better creditworthiness. Our results are in line with those of Kim et al. (2023), which find that sustainability-linked loans are larger than non-ESG loans and are typically issued to safer borrowers. Finally, the benefits of tranching are superior to conventional deals.

[22] In unreported estimations, we examine whether results presented in Table 10 are robust by considering firm fixed effects to address possible time invariant firm-level issues. We also re-estimate our models by using year times industry and country times industry fixed effects. Results are qualitatively the same and are available if required.

Concerning variables that proxy for syndicate structure, we show that repeated borrowing from the same lender affects the choice between sustainable and conventional debt deals, increasing the probability of observing the former. This result is in line Kim *et al.* (2023) findings. Authors show that sustainability-linked loans are also more likely to be syndicated by relationship banks. However, this can raise greenwashing concerns, as it may imply that banks and borrowers with pre-existing relationships can conveniently relabel revolving credit lines as sustainable, namely for sustainability-linked loans, as these general purpose loans do not need to be tied to specific green or social projects.

Smaller and more concentrated syndicates decrease the probability of observing a sustainable deal, which can be explained by the fact that these deals are larger, requiring a higher number of participating banks to share the risks. Both foreign bank participation and bank reputation do not affect the borrowers' choice between sustainable and conventional deals.

The higher the environmental policy stringency of a country, the higher the probability of a firm located in such a country to choose a sustainable deal over a conventional deal. Institutional factors also affect firms' choice: while the *antidirector rights* variable significantly and positively affects the sponsors' choice of sustainable over conventional deals, the impact of the enforcement level is significant and negative. This can be explained by the fact that there is currently limited enforcement of the law for supervising sustainable loans' integrity. Finally, the yield curve slope also affects significantly and positively the likelihood of observing a sustainable syndicated deal.

6. Conclusion

This paper provides the first comprehensive analysis of sustainable loan pricing, which has grown exponentially within the past five years. We compare spreads and the pricing of sustainable loans to that of conventional loans, using a cross-section of syndicated loans closed by borrowers in OECD countries during the 2018-2022 period. We also examine if comparable sustainable and conventional loans have significantly different spreads. At the deal level, we study whether sponsoring firms use sustainable deals to reduce borrowing costs and what the determinants of firms' syndicated deal choices are.

Our results are relevant for banks and market supervisors. We find that sustainable and conventional loans are securities influenced differently by common pricing characteristics. We show that spreads of sustainable loan

tranches do not differ significantly *vis-à-vis* comparable conventional loans. Our results hold for subsamples of sustainable-linked loans, green loans, and social loans. A detailed analysis at the tranche level reveals that sustainable loan spreads are influenced manly by (*i*) credit rating, if the loan is subordinated and whether the borrower closed previously a syndicated loan, at the contractual level; (*ii*) the number of banks involved and lead's bank reputation, at the syndicate structure level; and (*iii*) by market volatility, at the macro level. On the contrary, several contractual characteristics that affect conventional loan spreads (maturity, borrower's rating, transaction size, number of tranches, country risk, if the lead bank is a domestic bank, if the borrower belongs to a country with a market-based financial system, and antidirector rights' index) do not influence sustainable loan spreads.

When implementing a deal-level analysis, we find that borrowers do not use sustainable deals as a mechanism of managing the firms' cost of borrowing. We find that the deals' weighted average spread does not differ significantly between sustainable and comparable conventional syndicated deals. Moreover, the choice between sustainable and conventional deals depends on exogenous factors like shareholders protection, debt enforcement, credit risk, and environmental policy stringency levels of the borrower's country; in relation to sponsoring firms' characteristics - creditworthiness -; syndicated structure - number of banks involved and if the deal is a repeated borrowing from the same lender; and objectives to be achieved by firms, particularly with regard to obtaining higher volumes of financing with longer maturities.

Considering that firms choose sustainable financing to mitigate adverse selection problems with respect to their ESG activities, to capture expected economies of scale associated with borrowing contracting, and extended to firms with better creditworthiness, we believe that this study is also important for policymakers. Taking into consideration the important role of sustainable financing in promoting public and private investment and as a driver of economic growth, we believe that policymakers should have better knowledge of sustainable syndicated loan instruments, allowing for more precise and efficient regulatory interventions.

The principal limitation of this study emerges from the quality of the data available. The lack of historical data, and consistent methodologies - Berg *et al.* (2022) document a significant ESG rating divergence of the six prominent ESG rating agencies -, standardized metrics, and comparable disclosures (Eren *et al.* 2022) increases uncertainty and asymmetric information, hampering loan pricing. Sustainable

syndicated loans are a particularly recent debt instrument and available data on key pricing factors like spread and tranche rating is scarce. An opportunity for future research is therefore to analyze the pricing of these instruments with a greater number of observations, particularly for green and social loans.

Initial steps towards including ESG-based solutions in company strategies were made by the 2015 Paris Agreement. Although GLP, SLP and SLLP, have been implemented to provide the best practice principles for the green, social, and sustainability loan market, there is still a risk of "greenwashing", "socialwashing" and "sustainability washing". Recent regulatory initiatives, such as the introduction of Regulation (EU) 2020/852 of the European Parliament and EU Council (the "Taxonomy Regulation") in Europe and the SEC's efforts to label ESG products or regulate ESG disclosures, may promote mitigation of asymmetric information costs between borrowers and lenders and improve security design. We also leave these analyses for future research.

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Table 1: Distribution of the sample by year, region and industry, and top borrowers and switchers

Panel A: Distribution of syndicated loans by year

	Sustainability-linked loans			Green loans			Social loans			Conventional loans		
Year	Number of loans	Number of deals	Total Value ($ million)	Number of loans	Number of deals	Total Value ($ million)	Number of loans	Number of deals	Total Value ($ million)	Number of loans	Number of deals	Total Value ($ million)
2018	4	4	3,399	6	4	872	0	0	0	5,925	3,905	2,494,770
2019	22	15	14,741	12	7	838	3	1	98	5,163	3,319	2,117,250
2020	54	27	33,684	20	11	3,755	0	0	0	3,794	2,623	1,596,492
2021	258	164	247,264	22	13	3,217	0	0	0	5,243	3,609	2,645,481
2022	243	147	201,587	59	32	17,192	9	5	1,137	4,125	2,873	2,173,317
Total	**581**	**357**	**500,676**	**119**	**67**	**25,874**	**12**	**6**	**1,236**	**24,250**	**16,329**	**11,027,309**

Panel B: Geographic distribution of syndicated loans

	Sustainable loans				Conventional loans			
Geographic region of borrower	Number of loans	Number of deals	Total Value ($ million)	% of Total Value	Number of loans	Number of deals	Total Value ($ million)	% of Total Value
Asia	100	57	17,780	3.37%	809	332	64,463	0.58%
Australia	12	3	2,675	0.51%	356	151	86,619	0.79%
Europe	271	133	120,354	22.80%	2,306	1,293	844,971	7.66%
Eastern Europe	1	1	1,251	0.24%	7	4	2,717	0.02%
Western Europe	270	132	119,103	22.57%	2,299	1,289	842,254	7.64%
Spain	111	47	21,794	4.13%	329	168	68,657	0.62%
United Kingdom	28	15	19,923	3.77%	466	271	215,937	1.96%
North America	326	234	386,427	73.22%	20,760	14,536	10,023,177	90.89%
United States of America	310	222	370,350	70.17%	19,758	13,865	9,619,997	87.24%
South America	3	3	549	0.10%	19	17	8,080	0.07%
Total	**712**	**430**	**527,785**	**100.00%**	**24,250**	**16,329**	**11,027,309**	**100.00%**

Panel C: Distribution of syndicated loans by industrial category of borrower

All loans	Sustainable loans				Conventional loans			
Industrial Category of Borrower	Number of loans	Number of deals	Total Value ($ million)	% of Total Value	Number of loans	Number of deals	Total Value ($ million)	% of Total Value
Commercial and Industrial	513	303	393,671	74.59%	19,762	13,055	8,512,771	77.20%
Agriculture, Forestry and Fishing	17	9	10,032	1.90%	419	250	123,072	1.12%
Communications	17	8	16,224	3.07%	633	385	507,247	4.60%
Construction/Heavy Engineering	39	21	14,466	2.74%	1,221	796	409,255	3.71%
Manufacturing	160	97	164,815	31.23%	7,541	4,947	3,476,086	31.52%
Auto/Truck	24	14	44,745	8.48%	661	423	297,911	2.70%
Chemicals, Plastic and Rubber	27	15	14,510	2.75%	810	535	430,511	3.90%
Computers and Eletronics	35	26	65,513	12.41%	2,846	1,854	1,418,744	12.87%
Food and Beverages	25	16	14,123	2.68%	958	620	399,078	3.62%
Mining and Natural Resources	3	3	6,379	1.21%	125	87	69,799	0.63%
Oil and Gas	17	13	27,460	5.20%	1,244	1,033	771,769	7.00%
Real Estate	184	108	98,591	18.68%	2,972	2,077	811,138	7.36%
Retail Trade	18	14	13,531	2.56%	704	505	382,374	3.47%
Services	58	30	42,173	7.99%	4,903	2,975	1,962,032	17.79%
Healthcare	28	16	30,428	5.77%	1,923	1,191	1,015,954	9.21%
Professional Services	23	12	10,286	1.95%	1,648	1,010	476,695	4.32%
Finance and Insurance	74	49	47,416	8.98%	2,161	1,624	1,331,423	12.07%
Utilities	76	53	66,324	12.57%	1,285	953	706,777	6.41%
Transportation	23	15	12,680	2.40%	829	564	318,030	2.88%
Multiple	26	10	7,694	1.46%	213	133	158,308	1.44%
Total	**712**	**430**	**527,785**	**100.00%**	**24,250**	**16,329**	**11,027,309**	**100.00%**

Panel D: Top 10 borrowers

Sustainable loans			Conventional loans		
	By value of deals	By number of deals		By value of deals	By number of deals
Ford Motor	6.28%	0.98%	UnitedHealth Group	0.65%	0.07%
Pfizer	2.78%	0.28%	AT&T	0.62%	0.04%
Dell	2.19%	0.28%	Depository Trust Corp.	0.58%	0.02%
American Electric Power	1.88%	0.56%	Johnson & Johnson	0.47%	0.02%
Alphabet	1.76%	0.28%	Boeing	0.45%	0.05%
Prologis LP	1.66%	0.98%	Walmart	0.42%	0.05%
CHPE LLC	1.21%	0.28%	Duke Energy	0.39%	0.03%
Welltower	1.15%	0.84%	American Tower	0.36%	0.07%
Crown Castle International	1.11%	0.28%	Exxon Mobil	0.35%	0.02%
Equinor ASA	1.06%	0.14%	Chicago Mercantile Exchange	0.32%	0.02%

Panel E: Top 10 Switchers

Sustainable loans			Conventional loans		
	By value of deals	By number of deals		By value of deals	By number of deals
Ford Motor	9.13%	1.67%	Ford Motor	6.68%	3.03%
Pfizer	4.05%	0.48%	Dell	4.43%	0.83%
Dell	3.18%	0.48%	Crown Castle International	4.40%	0.83%
American Electric Power	2.73%	0.95%	Deere & Co	4.23%	1.10%
Prologis LP	2.42%	1.67%	Ares Capital	3.73%	1.66%
Welltower	1.67%	1.43%	BlackRock	3.62%	1.10%
Crown Castle International	1.61%	0.48%	Pfizer	3.41%	0.41%
Hyundai Capital America	1.54%	0.48%	Occidental Petroleum	3.22%	0.55%
Intel	1.41%	0.24%	Southern California Edison	3.12%	1.10%
Hewlett Packard Enterprise	1.30%	0.24%	Carlyle Group	2.02%	1.38%

Panel A describes the distribution of sustainable and conventional syndicated loans by year, Panel B details the loan allocation to borrowers in a particular country, whereas Panel C presents the industrial distribution of loans. Panel D and Panel E ranks the top 10 borrowers and switchers, respectively, by value and number of deals. Data are for syndicated loans with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Sustainability-linked loans are those that comply with the Sustainability-Linked Loan Principles, green loans with the Green Loan Principles, and social loans with the Social Loan Principles.

Table 2: Definition of variables, sources, and the expected impact on spread

Variable	Description	Source	Expected impact on spread
Dependent variables:			
Spread	Spread of the loan tranche (in bps) including margin and fees - thanche all-in pricing.	Loan Analytics	
WAS	The Weighted Average Spread (WAS) is the weighted average between the loan spread and its weight in the deal size.	Authors'	
Choice of debt	Dummy equal to 1 if a borrower closes a sustainable loan deal and 0 if it, instead, closes a conventional loan deal.	Authors'	
Independent variables:			
Core variables			
Sustainable	Dummy equal to 1 if the loan is ESG-linked, and 0 otherwise.	Loan Analytics	-
Maturity	Maturity of loan, in years.	Loan Analytics	+
Rated	Dummy equal to 1 if the loan tranche has a credit rating from Fitch, Moody's and/or S&P, and 0 otherwise.	Loan Analytics	-
Tranche rating	The Fitch, S&P and/or Moody's tranche rating at closing; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=24. If a tranche has more than one credit rating, the average is computed.	Loan Analytics	+
Rated borrower	Dummy equal to 1 if the borrower has a credit rating from Fitch, Moody's and/or S&P, and 0 otherwise.	Datastream	-
Borrower rating	The Fitch, S&P and/or Moody's tranche rating at closing; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=24. If a tranche has more than one credit rating, the average is computed.	Datastream	+
Contractual controls			
Transaction size	Loan deal size measured in $ million.	Loan Analytics	-
Number of tranches	Number of loans per deal.	Loan Analytics	-
Currency risk	Dummy equal to 1 for loans that are denominated in a currency different from the currency in the borrower's home country.	Loan Analytics	+
Experienced	Dummy equal to 1 for borrowers who have closed a syndicated loan (sustainable or conventional) previously.	Authors'	-
Switcher	Dummy equal to 1 for borrowers that have closed simultaneously a sustainable and a convenional loan in the sampling period.	Authors'	-
Subordinated	Dummy equal to 1 for tranches that are subordinated - classified by Dealscan as 'Junior Subordinated', 'Mezzanine', 'Senior Subordinated', 'Subordinated'-, and 0 otherwise.	Loan Analytics	+
Fee information	Dummy equal to 1 for tranches with information on fees, and 0 otherwise.	Loan Analytics	+
Term loan	Dummy equal to 1 if the loan is a term loan and 0 if the loan is a credit line.	Loan Analytics	+
Syndicate structure			
Former lender	Dummy equal to 1 if the borrowing firm already has an established relationship with a lead bank during our sampling period, and 0 otherwise.	Authors'	-
Number of banks	The number of lenders participating in the deal.	Loan Analytics	-
Domestic lead bank	Dummy equal to 1 if the bank's syndicate lead bank's (or at least one of the lead banks) nationality is the same as the deal country, and 0 otherwise.	Authors'	?
Bank reputation	Global syndicated loans mandated arrangers' rank according to Refinitiv League Tables for 2022. Ranks range from 1 (best) to 25 (worst).	Refinitiv Deals Intelligence	-
Bank ESG reputation	Global sustainable loans mandated arrangers' rank according to Refinitiv League Tables for 2022. Ranks range from 1 (best) to 25 (worst).	Refinitiv Deals Intelligence	-

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Variable	Description	Source	Expected impact on spread
Macroeconomic controls			
Country risk	S&P's country credit rating at closing. The rating is converted as follows: AAA=1, AA+=2, and so on until D=22.	S&P Global Ratings	+
Country ESG rating	Vigeo's country ESG rating at closing. Ratings range from 0 to 100, with 100 being the highest score for Corporate Social Responsibility (CSR).	CSR Hub	-
EPS	Environmental policy stringency measure per country. A higher value represents a more stringent policy.	OECD	-
EPI Ranking	Environmental Performance Index (EPI) ranks countries on climate change performance, environmental health, and ecosystem vitality.	YaleCELP & CIESIN	-
High Carbon	Dummy equal to 1 for borrowers that belong to a high carbon industry, and 0 otherwise.	Ehlers et al. (2022)	+
Capital Intensive	Dummy equal to 1 for borrowers that belong to a capital intensive industry, and 0 otherwise.	Alves et al. (2021)	-
Market-based	Dummy equal to 1 if the loan is extended to a borrower located in a country with a market-based financial system, and 0 otherwise.	Demirgüc-Kunt and Maksimovic (2002)	+
Creditor rights	Measured using La Porta et al. (1998) indices, revised by Djankov et al. (2007). We use four creditor rights variables (no automatic stay on assets; secured creditors first paid; restrictions for going into reorganization; management does not stay in reorganization) and added up the scores to create an index as in Esty and Megginson (2003).	LLSV (1998); Djankov et al. (2007)	-
Enforcement	Measured using La Porta et al.'s (1998) indices. We use five enforcement variables (efficiency of judicial system; rule of law; corruption; risk of expropriation; risk of contract repudiation) and added up the scores to create an index.	LLSV (1998)	-
Anti director rights	Measured using La Porta et al. (1998) indices, revised by Spamann (2010). Formed by adding one when (*i*) the country allows shareholders to mail their proxy votes; (*ii*) shareholders are not required to deposit their shares prior to the general shareholders' meeting; (*iii*) cumulative voting or proportional representation of minorities on the board of directors is allowed; (*iv*) an oppressed minorities mechanism is in place; (*v*) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10% of the sample median; or (*vi*) shareholders have preemptive rights that can only be waived by a shareholder meeting. The range for the index is from zero to six.	LLSV (1998); Spamann (2010)	+
Volatility	The Chicago Board Options Exchange Volatility Index (VIX). VIX reflects a market estimate of future volatility.	Datastream	+
5yTB-3mTB	The yield curve slope. Obtained as the difference between the U.S. five-year Treasury Bond rate and the U.S. 3-month Treasury Bill rate.	Datastream	-

The following characters mean: – = negative impact on spread | + = positive impact on spread | ? = sign cannot be clearly determined based on extant literature.

Table 3: Univariate statistics - pricing features associated with loans compared

Variable of interest		All loans	Conventional	Sustainable	
Continuous variables					
Spread (bps)	Mean	278.13	280.47	198.33	***
	Median	250.00	250.00	150.00	
	Number	24,962	24,250	712	
Maturity (years)	Mean	4.73	4.72	5.09	***
	Median	5.00	5.00	5.00	
	Number	24,962	24,250	712	
Tranche rating [1-24 weak]	Mean	12.52	12.58	10.92	***
	Median	14.00	14.00	11.00	
	Number	11,198	10,814	384	
Borrower rating [1-24 weak]	Mean	12.56	12.62	10.75	***
	Median	13.00	13.00	10.00	
	Number	10,343	9,986	357	
Transaction size ($ Million)	Mean	739.25	725.30	1,214.21	***
	Median	341.76	329.18	751.80	
	Number	24,962	24,250	712	
Number of tranches	Mean	1.96	1.94	2.40	***
	Median	2.00	2.00	2.00	
	Number	24,962	24,250	712	
Number of banks	Mean	6.53	6.41	10.74	***
	Median	5.00	5.00	9.00	
	Number	24,962	24,250	712	
Bank Reputation [1-25 weak]	Mean	8.26	8.27	7.79	*
	Median	3.00	3.00	3.00	
	Number	24,962	24,250	712	
Dummy variables					
Rated	% of d=1	44.86%	44.59%	53.93%	***
	Median	0	0	1	
	Number	24,962	24,250	712	
Rated borrower	% of d=1	41.43%	41.18%	50.14%	***
	Median	0	0	1	
	Number	24,962	24,250	712	
Currency risk	% of d=1	7.35%	7.07%	16.85%	***
	Median	0	0	0	
	Number	24,962	24,250	712	
Experienced	% of d=1	56.33%	56.07%	65.03%	***
	Median	1	1	1	
	Number	24,962	24,250	712	
Switcher	% of d=1	4.54%	2.95%	58.85%	***
	Median	0	0	1	
	Number	24,962	24,250	712	
Subordinated	% of d=1	1.73%	1.78%	0.28%	***
	Median	0	0	0	
	Number	24,962	24,250	712	
Fee information	% of d=1	24.94%	24.92%	25.56%	
	Median	0	0	0	
	Number	24,962	24,250	712	
Term loan	% of d=1	48.25%	48.20%	50.14%	
	Median	0	0	1	
	Number	24,962	24,250	712	
Former lender	% of d=1	42.37%	42.00%	55.06%	***
	Median	0	0	1	
	Number	24,962	24,250	712	
Domestic lead bank	% of d=1	90.60%	90.74%	85.81%	***
	Median	1	1	1	
	Number	24,962	24,250	712	

This table reports summary statistics for a sample of syndicated loans with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Sustainable loans include sustainability-linked loans, green loans, and social loans. Information on the characteristics of loan issuances and borrowing firms was obtained from Loan Analytics and Datastream. We test for similar distributions for sustainable *versus* conventional loans using Wilcoxon's rank-sum test for continuous variables and Fisher's exact test for discrete ones. ***, **, and * indicate significant difference at the 1%, 5%, and 10% levels, respectively. For a definition of the variables, see Table 2.

Table 4: The pricing of syndicated loans

Dependent variable: Spread	**[1] All loans**	**[2] All loans with borrowers' rating**	**[3] Rated loans**	**[4] Rated loans with borrowers' rating**	**[5] Matched sample**	**[6] Capital intensive industries**	**[7] High carbon industries**
Independent variables:							
Core variables							
Sustainable	-7.21	-6.81	13.35	14.13	-19.24	-4.28	-22.30
	(0.654)	(0.681)	(0.114)	(0.191)	(0.157)	(0.753)	(0.585)
Maturity	172.70 ***	179.46 ***	156.94 ***	156.23 ***	-0.96	124.23	244.19
	(0.000)	(0.000)	(0.000)	(0.000)	(0.502)	(0.474)	(0.126)
Log Maturity	-535.73 ***	-557.22 ***	-486.36 ***	-485.12 ***	44.79	-382.06	-822.91
	(0.000)	(0.000)	(0.000)	(0.000)	(0.347)	(0.476)	(0.131)
Rated	38.33 ***	34.35 ***			65.32 ***	42.45	29.81
	(0.000)	(0.000)			(0.000)	(0.180)	(0.103)
Tranche rating*rated	22.65 ***	19.02 ***	29.65 ***	24.49 ***	20.14 ***	18.61 ***	20.19 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rated borrower		-0.06		-24.04 ***		-4.52	-12.46
		(0.992)		(0.000)		(0.824)	(0.299)
Borrower rating*rated borrower		4.07 ***		5.48 ***		3.52	6.64 ***
		(0.004)		(0.000)		(0.233)	(0.003)
Contractual controls							
Log transaction size	-19.30 ***	-19.74 ***	-8.09 ***	-7.48 **	-5.33	-20.17	-19.91 *
	(0.000)	(0.000)	(0.005)	(0.010)	(0.246)	(0.193)	(0.059)
Number of tranches	-6.56 **	-6.57 **	-6.25 **	-6.43 **	-0.19	-8.01	-8.20
	(0.038)	(0.043)	(0.023)	(0.017)	(0.979)	(0.224)	(0.313)
Currency risk	16.58	16.22	-0.70	-0.64	-58.51 ***	-21.90	17.83
	(0.154)	(0.177)	(0.907)	(0.915)	(0.002)	(0.573)	(0.483)
Experienced	41.25 ***	41.23 ***	24.36 ***	23.70 ***	-26.58	35.07	46.73 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.524)	(0.138)	(0.003)
Switcher	5.63	6.19	-10.25 *	-9.74		1.83	15.16
	(0.615)	(0.591)	(0.088)	(0.100)		(0.901)	(0.492)
Subordinated	112.79 **	110.80 **	116.50 ***	124.41 ***		132.38	53.56
	(0.012)	(0.018)	(0.003)	(0.002)		(0.177)	(0.736)
Fee information	1.38	1.47	-2.93	-2.66	5.92	0.31	3.77
	(0.544)	(0.527)	(0.247)	(0.291)	(0.682)	(0.945)	(0.411)
Term loan	-4.09	-5.94	-19.21	-21.45 *	-2.27	-2.39	-25.90
	(0.671)	(0.546)	(0.111)	(0.073)	(0.852)	(0.929)	(0.496)
Syndicate structure							
Former lender	-1.49	-1.49	-2.46	-1.28	-2.63	-11.88 **	7.99
	(0.568)	(0.574)	(0.435)	(0.682)	(0.792)	(0.022)	(0.311)
Number of banks	0.37	0.46	-0.12	-0.12	0.00	-0.27	0.20
	(0.615)	(0.539)	(0.804)	(0.800)	(0.998)	(0.920)	(0.881)
Domestic lead bank	-29.77 ***	-29.60 ***	-14.98 **	-15.11 **	-29.05	-38.73 ***	-15.69
	(0.000)	(0.000)	(0.012)	(0.011)	(0.174)	(0.005)	(0.243)
Bank reputation	3.35 ***	3.34 ***	2.22 ***	2.19 ***	0.64	2.15 **	3.49 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.586)	(0.014)	(0.000)

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Dependent variable: Spread	**[1] All loans**	**[2] All loans with borrowers' rating**	**[3] Rated loans**	**[4] Rated loans with borrowers' rating**	**[5] Matched sample**	**[6] Capital intensive industries**	**[7] High carbon industries**
Independent variables:							
Macroeconomic controls							
Country risk	-9.74 ***	-10.18 ***	-1.30	-1.22	17.65 ***	-12.26	-13.43
	(0.007)	(0.006)	(0.632)	(0.651)	(0.001)	(0.515)	(0.154)
EPS	1.84	2.09	9.82	11.97	63.50 **	56.52	5.00
	(0.915)	(0.906)	(0.437)	(0.341)	(0.039)	(0.323)	(0.896)
Market-based	74.55 ***	72.40 **	4.41	3.53	82.75 *	107.00 **	25.93
	(0.006)	(0.010)	(0.777)	(0.819)	(0.071)	(0.020)	(0.663)
Creditor rights	-10.42	-10.06	4.20	4.67	10.94	34.59	-3.65
	(0.323)	(0.354)	(0.531)	(0.482)	(0.455)	(0.489)	(0.871)
Enforcement	-0.12	-0.12	-0.46	-0.41	-1.24	-8.26	0.49
	(0.930)	(0.929)	(0.654)	(0.685)	(0.630)	(0.138)	(0.883)
Antidirector rights	-11.32 **	-11.00 **	8.19 **	8.80 **	-15.19	-0.77	-17.54
	(0.026)	(0.035)	(0.049)	(0.034)	(0.195)	(0.947)	(0.220)
Volatility	0.54 ***	0.56 ***	0.45 ***	0.50 ***	1.45	0.02	0.48
	(0.002)	(0.002)	(0.009)	(0.003)	(0.435)	(0.937)	(0.127)
5yTB_3mTB	-0.01	-0.01	-0.06 **	-0.06 **	-0.08	-0.05	0.02
	(0.608)	(0.671)	(0.012)	(0.014)	(0.393)	(0.535)	(0.761)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Funding purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal status fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	24,962	24,962	11,198	11,198	834	7,374	12,159
of which ESG	712	712	384	384	417	290	331
of which conventional	24,250	24,250	10,814	10,814	417	7,084	11,828
Adjusted R^2	44.43%	44.74%	52.37%	52.79%	51.63%	28.24%	37.53%
Anderson's LR statistic	8.66	8.52	19.17	18.91	11.13	10.48	11.60
p-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen's J-statistic	2.74	2.59	2.40	1.82	0.00	1.08	1.94
p-value	(0.198)	(0.108)	(0.121)	(0.177)	(1.000)	(0.299)	(0.208)

This table presents the results of GMM regressions on spreads (all-in pricing in bps) for syndicated loans with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Sustainable loans include sustainability-linked loans, green loans, and social loans. Information on the characteristics of loan issuances and borrowing firms was obtained from Loan Analytics and Datastream. Models [1] and [2] reflect the full sample. Models [3] and [4] focus on a subsample for loans with information on credit rating. Model [5] is estimated for a subsample of sustainable loans and a matched sample (control group) of conventional loans. To create a matched sample of conventional loans, we employ a propensity score matching approach (bond-level PSM), by creating a 1 to 1 matching algorithm that captures the most identical conventional loan closed by the same firm in the same year, using the following characteristics: loan rating, size, and maturity. Models [6] and [7] focus on a subsample of firms belonging to capital intensive and high carbon industries, respectively. We conduct Anderson's LR test of the null hypothesis that our instruments – if the loan is tranched and the tranche size – and endogenous variables are not correlated, and Hansen's J-test for overidentification restrictions. For each independent variable, the first row reports the estimated coefficient, and the second row reports the p-value. Standard errors are heteroskedasticity robust and clustered at the deal-year level. ***, ** and * indicate that the reported coefficients are significantly different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 2.

Table 5: The pricing of syndicated loans: category breakdown

Dependent variable: Spread	**[1a] All loans**	**[2a] All loans with borrowers' rating**	**[3a] Rated loans**	**[4a] Rated loans with borrowers' rating**	**[5a] Matched sample**	**[6a] Capital intensive industries**	**[7a] High carbon industries**
Independent variables:							
Core variables							
Sustainability-linked loan	26.47 **	27.87 **	17.40	18.03	-15.72	8.29	34.54
	(0.029)	(0.026)	(0.200)	(0.150)	(0.228)	(0.616)	(0.115)
Green loan	-160.14 **	-164.38 **	-131.71	-130.77	-34.47	-39.89	-296.09
	(0.025)	(0.026)	(0.123)	(0.124)	(0.195)	(0.435)	(0.359)
Social loan	51.14	54.40	211.34 **	222.57 **	-27.54	0.10	
	(0.497)	(0.489)	(0.015)	(0.011)	(0.297)	(0.998)	
Maturity	164.59 ***	171.21 ***	155.21 ***	154.84 ***	-1.07	126.06	177.65 *
	(0.000)	(0.000)	(0.000)	(0.000)	(0.474)	(0.482)	(0.082)
Log Maturity	-508.88 ***	-529.89 ***	-480.99 ***	-480.84 ***	48.83	-387.52	-595.14 *
	(0.000)	(0.000)	(0.000)	(0.000)	(0.320)	(0.483)	(0.087)
Rated	38.25 ***	34.31 ***			64.31 ***	42.24	35.69 ***
	(0.000)	(0.000)			(0.001)	(0.193)	(0.006)
Tranche rating*rated	22.68 ***	19.01 ***	29.69 ***	24.51 ***	19.99 ***	18.73 ***	19.08 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Rated borrower		-0.18		-23.87 ***		-4.04	-15.48 *
		(0.973)		(0.000)		(0.848)	(0.089)
Borrower rating*rated borrower		4.13		5.50 ***		3.55	6.58 ***
		(0.003)		(0.000)		(0.233)	(0.001)
Contractual controls							
Log transaction size	-18.62 ***	-19.05 ***	-7.98 ***	-7.41 **	-6.17	-20.43	-15.79 **
	(0.000)	(0.000)	(0.005)	(0.010)	(0.202)	(0.203)	(0.024)
Number of tranches	-6.28 *	-6.28 *	-6.20 **	-6.37 **	-0.65	-8.10	-7.17
	(0.040)	(0.045)	(0.023)	(0.017)	(0.930)	(0.234)	(0.237)
Currency risk	14.81	14.38	-0.32	-0.27	-57.48 ***	-22.45	17.53
	(0.176)	(0.203)	(0.957)	(0.964)	(0.002)	(0.575)	(0.346)
Experienced	40.47 ***	40.42 ***	24.29 ***	23.63 ***	-23.71	35.27	42.93 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.578)	(0.147)	(0.000)
Switcher	4.05	4.56	-8.38	-7.80		1.52	6.47
	(0.698)	(0.671)	(0.155)	(0.179)		(0.916)	(0.628)
Subordinated	119.93 ***	118.11 ***	118.53 ***	126.05 ***		131.03	120.17
	(0.005)	(0.008)	(0.002)	(0.001)		(0.196)	(0.241)
Fee information	1.41	1.50	-3.01	-2.75	4.63	0.43	2.80
	(0.527)	(0.510)	(0.233)	(0.273)	(0.757)	(0.927)	(0.436)
Term loan	-2.19	-4.01	-18.43	-20.80 *	-2.93	-2.57	-8.98
	(0.811)	(0.667)	(0.120)	(0.077)	(0.811)	(0.926)	(0.710)
Syndicate structure							
Former lender	-1.70	-1.70	-2.65	-1.45	-4.41	-11.96 **	5.71
	(0.505)	(0.512)	(0.396)	(0.637)	(0.666)	(0.024)	(0.319)
Number of banks	0.16	0.24	-0.15	-0.15	0.03	-0.30	-0.50
	(0.820)	(0.728)	(0.736)	(0.738)	(0.971)	(0.910)	(0.559)
Domestic lead bank	-30.49 ***	-30.35 ***	-14.76 **	-14.90 **	-30.52	-38.84 ***	-16.25
	(0.000)	(0.000)	(0.012)	(0.011)	(0.165)	(0.006)	(0.115)
Bank reputation	3.34 ***	3.33 ***	2.22 ***	2.19 ***	0.49	2.13 **	3.53 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.702)	(0.019)	(0.000)

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Dependent variable: Spread	**[1a] All loans**	**[2a] All loans with borrowers' rating**	**[3a] Rated loans**	**[4a] Rated loans with borrowers' rating**	**[5a] Matched sample**	**[6a] Capital intensive industries**	**[7a] High carbon industries**
Independent variables:							
Macroeconomic controls							
Country risk	-9.33 ***	-9.75 ***	-0.76	-0.65	17.65 ***	-12.15	-9.86
	(0.007)	(0.006)	(0.778)	(0.807)	(0.001)	(0.523)	(0.115)
EPS	2.58	2.86	10.98	13.20	64.17 **	55.64	10.40
	(0.876)	(0.866)	(0.382)	(0.292)	(0.036)	(0.332)	(0.703)
Market-based	72.53 ***	70.35 ***	1.50	0.47	80.50 *	106.85 **	23.66
	(0.006)	(0.010)	(0.921)	(0.975)	(0.083)	(0.022)	(0.602)
Creditor rights	-8.46	-8.05	5.04	5.55	11.23	34.96	0.34
	(0.395)	(0.433)	(0.444)	(0.396)	(0.441)	(0.496)	(0.983)
Enforcement	-0.05	-0.06	-0.28	-0.23	-1.38	-8.21	0.39
	(0.968)	(0.967)	(0.777)	(0.817)	(0.598)	(0.142)	(0.876)
Antidirector rights	-10.71 **	-10.36 **	7.84 *	8.46 **	-15.00	-0.54	-14.51
	(0.027)	(0.038)	(0.058)	(0.041)	(0.197)	(0.964)	(0.150)
Volatility	0.57 ***	0.58 ***	0.45 ***	0.51 ***	1.64	0.03	0.55 **
	(0.001)	(0.001)	(0.007)	(0.002)	(0.401)	(0.918)	(0.032)
5yTB_3mTB	-0.02	-0.02	-0.06 **	-0.05 **	-0.09	-0.05	0.00
	(0.434)	(0.490)	(0.013)	(0.016)	(0.351)	(0.535)	(0.971)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Funding purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal status fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	24,962	24,962	11,198	11,198	834	7,374	12,159
of which Sustainable	581	581	361	361	342	212	279
of which Green	119	119	19	19	67	70	52
of which Social	12	12	4	4	8	9	0
of which conventional	24,250	24,250	10,814	10,814	417	7,083	11,828
Adjusted R^2	7.97%	3.84%	53.07%	53.39%	45.71%	27.38%	37.53%
Anderson's LR statistic	9.03	8.89	20.00	19.77	11.02	10.38	12.56
p-value	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen's J-statistic	3.91	3.73	2.70	2.08	0.00	1.12	1.66
p-value	(0.148)	(0.154)	(0.101)	(0.150)	(1.000)	(0.291)	(0.367)

This table presents the results of GMM regressions on spreads (all-in pricing in bps) for syndicated loans with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Information on the characteristics of loan issuances and borrowing firms was obtained from Loan Analytics and Datastream. Models [1a] and [2a] reflect the full sample. Models [3a] and [4a] focus on a subsample for loans with information on credit rating. Model [5a] is estimated for a subsample of sustainable loans and a matched sample (control group) of conventional loans. To create a matched sample of conventional loans, we employ a propensity score matching approach (bond-level PSM), by creating a 1 to 1 matching algorithm that captures the most identical conventional loan closed by the same firm in the same year, using the following characteristics: loan rating, size, and maturity. Models [6a] and [7a] focus on a subsample of firms belonging to capital intensive and high carbon industries, respectively. Sustainable-linked loan is a dummy variable equal to 1 if the loan complies with the SLLP, and 0 otherwise. Green loan is a dummy variable equal to 1 if the loan complies with the GLP, and 0 otherwise. Social loan is a dummy variable equal to 1 if the loan complies with the SLP, and 0 otherwise. We conduct Anderson's LR test of the null hypothesis that our instruments – if the loan is tranched and the tranche size – and endogenous variables are not correlated, and Hansen's J-test for overidentification restrictions. For each independent variable, the first row reports the estimated coefficient and the second row reports the p-value. Standard errors are heteroskedasticity robust and clustered at the deal-year level. ***, ** and * indicate that the reported coefficients are significantly different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 2.

Table 6: Endogenous switching regression models

Dependent variable:	**[8]**		**[9]**	
Spread (bps)	**Conventional loans**	**Sustainable loans**	**Conventional loans with borrowers' rating**	**Sustainable loans with borrowers' rating**
Independent variables:				
Intercept	-268.46 ***	-561.42 ***	-268.99 ***	-563.55 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Maturity	0.48	-13.04 ***	0.42	-13.01 ***
	(0.726)	(0.000)	(0.760)	(0.000)
Log Maturity	20.93 ***	77.79 ***	20.77 ***	77.47 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Rated	71.45 ***	122.97 ***	64.95 ***	124.83 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Tranche rating*rated	24.67 ***	28.99 ***	18.06 ***	31.08
	(0.000)	(0.000)	(0.000)	(0.634)
Borrower rating*rated borrower			7.30 ***	-2.31 ***
			(0.000)	(0.000)
Log transaction size	-2.51 *	21.22 ***	-2.38 *	21.30 ***
	(0.063)	(0.000)	(0.075)	(0.000)
Number of tranches	-14.26 ***	-14.21 ***	-14.26 ***	-14.08 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Currency risk	17.80 ***	28.62 **	17.32 ***	28.59 **
	(0.000)	(0.040)	(0.000)	(0.040)
Experienced	56.30 ***	46.14 ***	55.80 ***	45.74 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Switcher	-97.52 ***	46.14	-97.06 ***	-25.20
	(0.000)	(0.167)	(0.000)	(0.218)
Subordinated	301.33 ***	201.83 *	308.64 ***	198.85 *
	(0.000)	(0.061)	(0.000)	(0.068)
Fee information	-1.91	-5.05	-1.88	-5.01
	(0.282)	(0.495)	(0.288)	(0.499)
Term loan	32.11 ***	-0.75	31.08 ***	-1.00
	(0.000)	(0.942)	(0.000)	(0.924)
Former lender	-9.43 ***	-8.17	-9.47 ***	-8.31
	(0.000)	(0.562)	(0.000)	(0.555)
Number of banks	-2.92 ***	-2.76 ***	-2.92 ***	-2.75 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Domestic lead bank	-36.68 ***	-4.48	-36.00 ***	-4.38
	(0.000)	(0.807)	(0.000)	(0.814)
Bank reputation	4.51 ***	3.45 ***	4.51 ***	3.42 ***
	(0.000)	(0.002)	(0.000)	(0.003)
Country risk	-5.50 ***	3.17	-5.73 ***	3.41
	(0.000)	(0.126)	(0.000)	(0.117)
EPS	23.86 ***	34.92 ***	23.63 ***	34.73 ***
	(0.000)	(0.001)	(0.000)	(0.001)
Market-based	94.35 ***	11.25	92.55 ***	11.29
	(0.000)	(0.499)	(0.000)	(0.506)
Volatility	0.65 ***	1.21 **	0.68 ***	1.18 *
	(0.000)	(0.047)	(0.000)	(0.054)
5yTB_3mTB	-0.05	0.06	-0.05	0.07
	(0.179)	(0.343)	(0.204)	(0.354)

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Dependent variable: Probability of observing:	Sustainable *versus* conventional loans	Sustainable *versus* conventional loans
Independent variables:		
Intercept	-0.11	-0.11
	(0.985)	(0.984)
Maturity	0.03	0.03
	(0.978)	(0.973)
Log Maturity	-0.03	-0.03
	(0.964)	(0.965)
Rated tranche	0.12	0.17
	(0.867)	(0.807)
Tranche rating*rated	-0.11	-0.06
	(0.661)	(0.809)
Rated borrower	-0.34 ***	-0.34 ***
	(0.008)	(0.005)
Borrower rating*rated borrower	-0.01	-0.07
	(0.933)	(0.278)
Log transaction size	0.18	0.18
	(0.105)	(0.107)
Number of tranches	0.06	0.06
	(0.764)	(0.764)
Currency risk	-0.03	0.01
	(0.989)	(0.998)
Experienced	-0.25 *	-0.25 *
	(0.063)	(0.068)
Switcher	1.13	1.13
	(0.115)	(0.116)
Subordinated	-2.02	-2.08
	(0.201)	(0.193)
Fee information	0.01	0.01
	(0.944)	(0.939)
Term loan	-0.36 ***	-0.36 ***
	(0.000)	(0.000)
Former lender	0.04	0.04
	(0.909)	(0.908)
Number of banks	0.02 ***	0.02 ***
	(0.000)	(0.000)
Domestic lead bank	0.29	0.28
	(0.672)	(0.670)
Bank reputation	-0.03	-0.03
	(0.619)	(0.620)
Country risk	0.09 ***	0.09 ***
	(0.006)	(0.006)
EPS	-0.28	-0.27
	(0.341)	(0.354)
Market-based	-0.65 ***	-0.63 ***
	(0.000)	(0.000)
Volatility	-0.01	-0.01
	(0.900)	(0.890)
5yTB_3mTB	0.00	0.00
	(0.763)	(0.766)
Number of observations	24,962	24,962
Average treatment effect	20.33	21.34
	(0.456)	(0.623)
Wald chi2	442.93 ***	419.40 ***
Log pseudolikelihood	-155,136.46	-155,092.95
Wald test of indep. equations	0.32	0.37

This table presents the results of estimating endogenous switching regression models on a sample of 712 sustainable loans and 24,250 conventional loans with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Sustainable loans include sustainability-linked loans, green loans, and social loans. We implement the full information maximum likelihood (FIML) method to simultaneously estimate binary and continuous parts of the model in order to yield consistent standard errors. For each independent variable, the first row reports the estimated coefficient, and the second row reports the p-value. Standard errors are heteroskedasticity robust and clustered at the country-year level. ***, ** and * indicate that the reported coefficients are significantly different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 2.

Table 7: Regression analyses of the determinants of loan spreads

Dependent variable: Spread	**[10] Conventional loans**	**[11] Conventional loans**	**[12] Sustainable loans**	**[13] Sustainable loans**
Independent variables:				
Core variables				
Maturity	159.69 ***	165.99 ***	30.22	33.28
	(0.000)	(0.000)	(0.465)	(0.445)
Log Maturity	-489.26 ***	-509.12 ***	-120.39	-132.88
	(0.000)	(0.000)	(0.466)	(0.445)
Rated	36.46 ***	32.25 ***	85.53 ***	98.48 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Tranche rating*rated	22.28 ***	18.64 ***	20.57 ***	22.44 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Rated borrower		0.18		-14.32
		(0.973)		(0.491)
Borrower rating*rated borrower		4.09 ***		-2.27
		(0.004)		(0.596)
Contractual controls				
Log transaction size	-18.28 ***	-18.70 ***	1.52	1.51
	(0.000)	(0.000)	(0.823)	(0.829)
Number of tranches	-6.52 **	-6.54 **	-6.66	-6.36
	(0.030)	(0.034)	(0.201)	(0.228)
Currency risk	10.05	9.51	21.15	23.20
	(0.342)	(0.382)	(0.434)	(0.417)
Experienced	41.09 ***	41.09 ***	22.41 **	21.43 **
	(0.000)	(0.000)	(0.012)	(0.015)
Switcher	2.13	2.65	-16.80	-16.79
	(0.834)	(0.799)	(0.309)	(0.317)
Subordinated	125.34 ***	123.75 ***	160.94 **	159.70 **
	(0.002)	(0.003)	(0.035)	(0.041)
Fee information	0.24	0.30	7.64	8.03
	(0.910)	(0.892)	(0.357)	(0.343)
Term loan	-0.74	-2.50	-1.36	-2.13
	(0.931)	(0.773)	(0.903)	(0.856)
Syndicate structure				
Former lender	-0.98	-0.96	6.26	7.32
	(0.703)	(0.711)	(0.641)	(0.589)
Number of banks	-0.07	0.01	-1.25 *	-1.22 *
	(0.911)	(0.986)	(0.088)	(0.096)
Domestic lead bank	-30.16 ***	-29.98 ***	-14.45	-14.71
	(0.000)	(0.000)	(0.465)	(0.471)
Bank reputation	3.37 ***	3.36 ***	2.54 ***	2.57 ***
	(0.000)	(0.000)	(0.003)	(0.003)

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Dependent variable: Spread	**[10] Conventional loans**	**[11] Conventional loans**	**[12] Sustainable loans**	**[13] Sustainable loans**
Independent variables:				
Macroeconomic controls				
Country risk	-10.64 ***	-11.05 ***	1.94	1.71
	(0.004)	(0.003)	(0.715)	(0.764)
EPS	5.94	6.45	18.23	14.63
	(0.720)	(0.705)	(0.566)	(0.671)
Market-based	69.61 **	67.51 **	25.92	24.80
	(0.012)	(0.018)	(0.607)	(0.633)
Creditor rights	-3.35	-2.76	-7.60	-9.69
	(0.749)	(0.797)	(0.662)	(0.609)
Enforcement	-0.23	-0.25	-0.33	-0.15
	(0.861)	(0.856)	(0.843)	(0.932)
Antidirector rights	-8.90 *	-8.53 *	-0.08	-0.87
	(0.065)	(0.085)	(0.992)	(0.918)
Volatility	0.55 ***	0.56 ***	1.34 *	1.29 *
	(0.001)	(0.001)	(0.054)	(0.067)
5yTB_3mTB	-0.03	-0.03	0.08	0.09
	(0.188)	(0.223)	(0.327)	(0.314)
Region fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Funding purpose fixed effects	Yes	Yes	Yes	Yes
Deal status fixed effects	Yes	Yes	Yes	Yes
Number of observations	24,250	24,250	712	712
Adjusted R^2	13.51%	9.93%	62.94%	61.40%
Anderson's LR statistic	10.27	10.12	1.76	1.70
p-value	(0.000)	(0.000)	(0.174)	(0.184)
Hansen's J-statistic	3.35	3.17	0.04	0.04
p-value	(0.067)	(0.075)	(0.846)	(0.850)

This table presents the results of GMM regressions on spreads (all-in pricing in bps) for syndicated loans with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Sustainable loans include sustainability-linked loans, green loans, and social loans. Information on the characteristics of loan issuances and borrowing firms was obtained from Loan Analytics and Datastream. Models [10] and [11] reflect the full sample for conventional loans, while models [12] and [13] focus on the full sample for sustainable loans. We conduct Anderson's LR test of the null hypothesis that our instruments – if the loan is tranched and the tranche size – and endogenous variables are not correlated, and Hansen's J-test for overidentification restrictions. For each independent variable, the first row reports the estimated coefficient and the second row reports the p-value. Standard errors are heteroskedasticity robust and clustered at the deal-year level. ***, ** and * indicate that the reported coefficients are significantly different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 2.

Table 8: Univariate statistics - pricing features associated with deals compared

Variable of interest		All deals	Conventional	Sustainable	
Continuous variables					
WAS	Mean	268.04	270.15	181.68	***
	Median	225.00	225.00	133.00	
	Number	16,632	16,235	397	
WAM	Mean	4.60	4.59	4.93	*
	Median	5.00	5.00	5.00	
	Number	16,632	16,235	397	
WAR	Mean	13.15	13.19	11.57	***
	Median	14.00	14.00	14.00	
	Number	16,632	16,235	397	
Borrower rating	Mean	12.23	12.30	10.10	***
	Median	13.00	13.00	9.00	
	Number	7,421	7,175	246	
Transaction size	Mean	692.13	677.51	1289.73	***
	Median	307.99	301.01	797.18	
	Number	16,632	16,235	397	
Number of tranches	Mean	1.49	1.49	1.65	***
	Median	1.00	1.00	1.00	
	Number	16,632	16,235	397	
Number of banks	Mean	6.30	6.19	10.76	***
	Median	5.00	5.00	9.00	
	Number	16,632	16,235	397	
Bank Reputation	Mean	7.60	7.63	6.52	***
	Median	2.00	2.00	2.00	
	Number	16,632	16,235	397	
Dummy variables					
Rated borrower	% of d=1	44.62%	44.19%	61.96%	***
	Median	0	0	1	
	Number	16,632	16,235	397	
Currency risk	% of d=1	6.37%	6.15%	15.11%	***
	Median	0	0	0	
	Number	16,632	16,235	397	
Experienced	% of d=1	34.86%	34.72%	40.55%	**
	Median	0	0	0	
	Number	16,632	16,235	397	
Switcher	% of d=1	4.18%	2.83%	59.70%	***
	Median	0	0	1	
	Number	16,632	16,235	397	
Former lender	% of d=1	45.89%	45.53%	60.71%	***
	Median	0	0	1	
	Number	16,632	16,235	397	
Domestic lead bank	% of d=1	90.96%	91.09%	85.64%	***
	Median	1	1	1	
	Number	16,632	16,235	397	

This table reports summary statistics for a sample of syndicated loan deals with spread and tranche/transaction amount available, closed by borrowers located in OECD countries during the 2018-2022 period. Sustainable loans include sustainability-linked loans, green loans, and social loans. Information on the characteristics of loan issuances and borrowing firms was obtained from Loan Analytics and Datastream. We test for similar distributions for sustainable *versus* conventional deals using Wilcoxon's rank-sum test for continuous variables and Fisher's exact test for discrete ones. ***, **, and * indicate significant difference at the 1%, 5%, and 10% levels, respectively. We use the WAS, computed as the weighted average between the bond tranche spread and its weight in the deal size, as a measure of the total cost of borrowing. WAM is the weighted average maturity and WAR is the weighted average rating. For a definition of the variables, see Table 2.

Table 9: Regression analyses of the cost of borrowing: PF versus CF deals

Dependent variable: WAS	[14] All deals	[15] All deals with borrowers' rating	[16] Rated deals	[17] Rated deals with borrowers' rating	[18] Matched Sample	[19] Capital intensive industries	[20] High carbon industries
Independent variables:							
Core variables							
Sustainable	-0.61	14.46	94.52	-29.02	-14.66	-4.54	94.07
	(0.931)	(0.277)	(0.229)	(0.273)	(0.338)	(0.687)	(0.218)
WAM	-33.70***	-84.06***	-266.56	110.13	16.35	-23.79	-194.77
	(0.002)	(0.001)	(0.195)	(0.250)	(0.691)	(0.279)	(0.130)
WAR	26.89***	42.24***	80.37**	64.93**	14.09***	20.72***	62.93***
	(0.000)	(0.000)	(0.038)	(0.047)	(0.000)	(0.000)	(0.008)
Rated borrower		124.11***		101.84*		57.61***	147.06**
		(0.000)		(0.059)		(0.000)	(0.032)
Borrower rating*rated borrower		-2.75		23.38		4.69*	0.13
		(0.182)		(0.215)		(0.061)	(0.979)
Contractual controls							
Log transaction size	7.32**	8.17*	37.22	44.09	-2.73	-3.93	40.59
	(0.010)	(0.080)	(0.216)	(0.260)	(0.822)	(0.319)	(0.192)
Number of tranches	-5.89***	2.39	-13.65	-18.38	1.41	-1.25	3.66
	(0.007)	(0.547)	(0.265)	(0.242)	(0.729)	(0.713)	(0.745)
Currency risk	12.20**	-0.38	14.03	10.89	-52.19	4.30	-17.15
	(0.036)	(0.969)	(0.605)	(0.706)	(0.145)	(0.698)	(0.611)
Experienced	34.74***	50.24***	81.56	79.87	-0.58	22.27***	77.98**
	(0.000)	(0.000)	(0.132)	(0.192)	(0.986)	(0.002)	(0.036)
Switcher	-10.68**	-23.46***	-80.79	-83.99		1.40	-91.85
	(0.028)	(0.006)	(0.127)	(0.181)		(0.885)	(0.116)
Syndicate structure							
Former lender	15.80***	-7.00	-45.38	-42.90	4.08	-8.39	-19.33
	(0.000)	(0.261)	(0.261)	(0.346)	(0.733)	(0.188)	(0.434)
Number of banks	-0.99***	-2.26***	-4.99*	-4.98	0.35	-1.99***	-2.73*
	(0.000)	(0.000)	(0.070)	(0.117)	(0.848)	(0.000)	(0.075)
Domestic lead bank	-27.99***	-19.84***	9.68	10.83	-32.91	-49.08***	-22.77
	(0.000)	(0.003)	(0.644)	(0.655)	(0.237)	(0.000)	(0.218)
Bank reputation	4.42***	5.11***	6.09**	6.28*	-0.12	2.95***	7.01***
	(0.000)	(0.000)	(0.024)	(0.053)	(0.938)	(0.000)	(0.000)
Macroeconomic controls							
Country risk	-2.57*	-1.81	-24.14	-25.70	19.20	0.43	10.91
	(0.065)	(0.420)	(0.193)	(0.252)	(0.136)	(0.902)	(0.378)
EPS	5.93	9.85	14.06	25.91	80.49**	12.12	25.33
	(0.467)	(0.452)	(0.761)	(0.636)	(0.041)	(0.557)	(0.558)
Market-based	56.53***	15.01	-155.23	-177.72	75.42**	62.44**	57.78
	(0.000)	(0.562)	(0.273)	(0.318)	(0.010)	(0.011)	(0.345)
Creditor rights	-9.50*	-1.99	28.77	34.45	23.20	-5.86	-7.28
	(0.056)	(0.808)	(0.425)	(0.433)	(0.188)	(0.626)	(0.767)
Enforcement	-0.28	-0.99	-1.57	-1.80	-2.69	-2.47	-3.81
	(0.716)	(0.396)	(0.732)	(0.726)	(0.158)	(0.236)	(0.379)
Antidirector rights	-10.75***	-8.35*	-22.40	-21.37	-6.91	-14.51*	-21.86
	(0.000)	(0.055)	(0.365)	(0.426)	(0.685)	(0.059)	(0.177)
Volatility	-0.78***	-1.87***	-7.21	-7.81	1.75	-0.33	-5.17
	(0.009)	(0.003)	(0.219)	(0.276)	(0.498)	(0.316)	(0.142)
5yTB_3mTB	0.02	0.08**	0.20	0.24	-0.10	0.06	0.21
	(0.302)	(0.024)	(0.315)	(0.351)	(0.550)	(0.155)	(0.155)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Funding purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal status fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	16,632	16,632	8,074	8,074	586	5,106	8,239
of which ESG	397	397	257	257	293	154	196
of which conventional	16,235	16,235	7,817	7,817	293	4,952	8,043
Adjusted R^2	30.49%	31.23%	56.47%	56.99%	68.52%	40.09%	34.24%
Anderson's LR statistic	20.53	10.02	0.92	0.72	1.06	2.92	1.44
p-value	(0.000)	(0.000)	(0.040)	(0.048)	(0.035)	(0.054)	(0.237)
Hansen's J-statistic	0.04	1.81	0.08	0.05	0.79	1.02	0.01
p-value	(0.843)	(0.178)	(0.774)	(0.820)	(0.374)	(0.313)	(0.911)

This table presents the results of GMM regressions on the determinants of deals' weighted average spread (WAS). *Sustainable* is a dummy variable. To create a matched sample of conventional deals, we employ a propensity score matching approach (deal-level PSM), by creating a 1 to 1 matching algorithm that captures the most identical conventional deal closed by the same firm in the same year, using the following characteristics: WAS, transaction size, and WAM. We conduct Anderson's LR test of the null hypothesis that our instruments – if the deal is tranched and year – and endogenous variables are not correlated, and Hansen's J-test for overidentification restrictions. For each independent variable, the first row reports the estimated coefficient and the second row reports the p-value. Standard errors are heteroskedasticity robust and clustered at the deal-year level. ***, ** and * indicate that the reported coefficients are significantly different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 2.

Table 10: Determinants of firms' debt choice between sustainable and conventional deals

Dependent variable: Choice of debt (Sustainable deal = 1; Conventional deal = 0)	[21] All deals	[22] All deals with borrowers' rating	[23] Rated deals	[24] Rated deals with borrowers' rating	[25] Matched sample	[26] Capital intensive industries	[27] High carbon industries
Independent variables:							
Core variables							
WAM	0.08 **	0.08 **	0.20 ***	0.21 ***	0.10	0.09 **	0.13 ***
	(0.019)	(0.016)	(0.000)	(0.000)	(0.369)	(0.013)	(0.006)
WAR	-0.12 ***	0.07	-0.16 ***	0.05	0.00	0.12	0.11
	(0.000)	(0.355)	(0.000)	(0.590)	(0.989)	(0.365)	(0.242)
Rated borrower		-0.14		0.33		-0.41	-0.26
		(0.482)		(0.387)		(0.264)	(0.356)
Borrower rating*rated borrower		-0.22 ***		-0.23 **		-0.28 **	-0.29 ***
		(0.002)		(0.012)		(0.027)	(0.002)
Contractual controls							
Log transaction size	0.31 ***	0.32 ***	0.31 ***	0.28 ***	0.36 *	0.29 **	0.33 ***
	(0.000)	(0.000)	(0.001)	(0.003)	(0.060)	(0.016)	(0.001)
Number of tranches	-0.24 **	-0.25 **	-0.53 *	-0.48 *	0.02	-0.36 *	-0.07
	(0.046)	(0.040)	(0.056)	(0.079)	(0.902)	(0.055)	(0.660)
Currency risk	-0.55 **	-0.49 **	-0.38	-0.42	0.75	0.14	-1.26 ***
	(0.025)	(0.044)	(0.226)	(0.177)	(0.108)	(0.738)	(0.002)
Experienced	0.20	0.23	0.15	0.18	-1.55 ***	0.17	0.08
	(0.348)	(0.275)	(0.711)	(0.652)	(0.005)	(0.605)	(0.801)
Switcher	3.88 ***	3.92 ***	4.07 ***	4.08 ***		4.20 ***	4.30 ***
	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)
Syndicate structure							
Former lender	0.22 **	0.19 **	0.18 **	0.19 **	1.97 ***	0.06 *	0.42 *
	(0.013)	(0.019)	(0.039)	(0.035)	(0.000)	(0.080)	(0.043)
Number of banks	0.06 ***	0.06 ***	0.04 ***	0.04 ***	0.01 *	0.04 *	0.06 ***
	(0.000)	(0.000)	(0.005)	(0.003)	(0.096)	(0.054)	(0.000)
Domestic lead bank	-0.10	-0.12	0.45	0.46	0.75	0.93	0.44
	(0.694)	(0.638)	(0.227)	(0.220)	(0.171)	(0.122)	(0.255)
Bank reputation	0.01	0.01	0.00	0.00	0.02	0.01	0.02
	(0.311)	(0.411)	(0.906)	(0.859)	(0.311)	(0.677)	(0.285)
Macroeconomic controls							
Country risk	0.06	0.06 *	0.16 **	0.17 ***	0.29 **	-0.14 **	-0.08
	(0.155)	(0.087)	(0.017)	(0.005)	(0.023)	(0.042)	(0.123)
EPS	0.85 ***	0.78 ***	1.51 ***	1.46 ***	1.37 *	1.17 **	0.37 **
	(0.004)	(0.008)	(0.001)	(0.001)	(0.075)	(0.038)	(0.045)
Market-based	-0.30	-0.16	-0.15	-0.08	-0.52	-1.90 **	-0.97
	(0.437)	(0.661)	(0.806)	(0.898)	(0.389)	(0.016)	(0.125)
Creditor rights	0.28	0.23	0.41	0.40	0.57	0.59 *	0.22
	(0.102)	(0.158)	(0.120)	(0.127)	(0.163)	(0.059)	(0.389)
Enforcement	-0.10 ***	-0.10 ***	-0.09 ***	-0.09 ***	-0.02	-0.19 ***	-0.07 *
	(0.000)	(0.000)	(0.007)	(0.003)	(0.725)	(0.000)	(0.078)
Antidirector rights	0.57 ***	0.50 ***	0.39 **	0.31 **	-0.06	0.66 ***	0.36 **
	(0.000)	(0.000)	(0.014)	(0.045)	(0.855)	(0.001)	(0.037)
Volatility	0.00 ***	0.00	-0.01 *	-0.01 *	-0.03	-0.01	0.00
	(0.809)	(0.750)	(0.098)	(0.095)	(0.119)	(0.263)	(0.894)
5yTB_3mTB	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Funding purpose fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal status fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	16,632	16,632	8,074	8,074	586	5,104	8,224
of which sustainable	397	397	257	257	293	154	196
of which conventional	16,235	16,235	7,817	7,817	293	4,950	8,028
Correct predictions	97.98%	97.99%	97.83%	97.83%	77.30%	97.55%	98.15%
Pseudo R^2	0.458	0.462	0.510	0.513	0.317	0.489	0.469

This table presents the results of logistic regressions which predict firms' choice between sustainable and conventional debt financing. The dependent variable equals 1 when a firm selects a sustainable syndicated deal and 0 when it chooses a conventional syndicated deal. Information on the characteristics of loan issuances and borrowing firms was obtained from Loan Analytics and Datastream. To create a matched sample of conventional deals, we employ a PSM approach, by creating a 1 to 1 matching algorithm that captures the most identical conventional deal closed by the same firm in the same year, using the following characteristics: WAR, transaction size, and WAM. For each independent variable, the first row reports the estimated coefficient, and the second row reports the *p*-value. Standard errors are heteroskedasticity robust and clustered at the firm-year level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.