# Who Benefits from Sustainability-linked Loans?

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# Abstract

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**Keywords:** ESG; sustainability-linked loans; borrower risk; selection effect; deposit; executive

**JEL Classification:** G20, G21, M14



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# When Sustainability Is Selected, Not Induced: Bank Incentives and the Credibility of SLLs[*]

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Abstract

We examine the economic incentives and mechanisms underlying banks' issuance of sustainability-linked loans (SLLs). We show that SLL issuance is dominated by a selection effect: banks disproportionately extend these contracts to borrowers with superior ex-ante credit profiles. Consequently, the lower ex-post default rates observed among SLL borrowers largely reflect inherent borrower quality rather than improvements induced by performance-linked loan features. Turning to market perception, we document a striking temporal reversal. Early SLL issuers attracted deposit inflows—consistent with credible ESG signaling—whereas later cohorts experienced significant deposit outflows amid growing concerns about greenwashing. Finally, we identify three key drivers of SLL supply: bank scale, organizational ESG commitment, and the depth of preexisting borrower relationships. Together, these findings reveal the strategic, credibility-sensitive nature of sustainability-linked lending and challenge the presumption that SLLs systematically generate meaningful behavioral change.

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## 1. Introduction

As environmental, social, and governance (ESG) considerations gained importance in global financial markets, Sustainability-Linked Loans (SLLs) became a popular instrument for integrating capital allocation with verifiable sustainability objectives. In contrast to conventional green bonds or use-of-proceeds loans, which earmark funds for specific eco-friendly projects, SLLs incorporate flexible pricing adjustments that incentivize or penalize borrowers contingent upon their attainment of predetermined ESG benchmarks (Sustainalytics, 2021; Kim, Kumar, Lee, and Oh, 2025). Prior literature has predominantly emphasized the demand-side dynamics of this market, such as the influence of SLLs on borrowers' long-term ESG trajectories, the robustness of key performance indicators (KPIs), and the potential for these instruments to drive genuine sustainability enhancements (e.g., Kim et al., 2025; Aleszczyk, Loumioti, and Serafeim, 2024; Auzepy, Bannier, and Martin, 2023). However, insights into the supply side remain sparse, particularly regarding the strategic incentives—such as risk mitigation and competitive positioning—that compel banks to originate SLLs and SLLs' effects on their operational and financial performance.

Furthermore, escalating scrutiny of greenwashing underscores that stakeholder perceptions of SLLs are dynamic and susceptible to erosion, as evidenced by cases in which contractual designs fail to yield meaningful ESG improvements (e.g., Amiram, Gavious, Jin, and Li, 2023). Despite this, scant empirical evidence exists on the temporal evolution of outcomes for SLL-issuing banks, including how depositors and investors respond to these products amid shifting market sentiment (Chen, Hung, and Wang, 2023). This study fills that gap by analyzing the time-varying market reactions to SLL issuance over an extended sample period, emphasizing deposit inflows and outflows as indicators of perceived authenticity and trust. In addition, we delineate the underlying

mechanisms that drive SLL origination, highlighting the roles of bank size, ESG-aligned executive compensation structures, and entrenched lending relationships in shaping issuance patterns.

We first document the temporal evolution of the SLL market size. Following the inaugural issuance in 2016, the market experienced a rapid expansion through 2021, measured by both total volume and relative issuance share. However, after peaking in 2021, issuance activity has declined steadily. This recent contraction is consistent with heightened market skepticism, specifically regarding greenwashing risks, and intensified regulatory scrutiny, as highlighted in recent analyses of contractual weaknesses and unfulfilled sustainability commitments (Auzepy et al., 2023). These dynamics suggest that investor perceptions of sustainability-linked instruments are not static, but rather evolving over time.

To investigate the presence of risk-based borrower selection in the SLL market, we construct a matched sample in which each SLL borrower is paired with a non-SLL borrower from the same country, industry, and loan origination year. For robustness, we also generate an alternative sample that excludes from the control group any borrower who used an SLL at any time during the 2016–2024 sample period.[1]

Using these samples, we compare the ex-ante risk profiles of SLL borrowers with those of their non-SLL counterparts, assessed three months prior to loan issuance. We begin by examining borrowers' probabilities of default over forecast horizons spanning 3 to 60 months. Our analysis reveals that SLL borrowers display significantly lower default probabilities than non-SLL borrowers across all examined horizons. This pattern holds when employing alternative risk metrics, such as S&P credit ratings and distance-to-default measures. Collectively, the evidence suggests that banks preferentially select safer borrowers for SLL contracts.

[1] All empirical analyses are conducted using both samples, and the results remain robust throughout.

Next, we investigate how banks' ex-ante borrower selection manifests in ex-post credit outcomes. In particular, we contrast the occurrence of defaults, credit downgrades, and upgrades throughout the loan term between SLL borrowers and their matched non-SLL counterparts. Our analysis reveals that SLL borrowers exhibit a substantially lower default rate than non-SLL borrowers. This finding implies that banks embed borrower risk fundamentals within their SLL origination choices, thereby effectively curbing their credit risk exposure.

While SLL borrowers demonstrate superior ex-post credit performance, it remains ambiguous whether this outcome originates from ex-ante borrower screening (selection) or the disciplinary influence of contractual incentives (treatment). To disentangle these pathways, we enhance our baseline specification by incorporating explicit controls for ex-ante creditworthiness. By conditioning on the initial risk profile, we seek to isolate the incremental influence of the SLL structure on default risk. Our analysis reveals that the observed risk mitigation is predominantly attributable to initial borrower quality, indicating that the effect is driven by selection rather than the contract's incentive mechanisms. This implies that SLLs primarily serve as screening or labeling instruments for safer borrowers rather than as catalysts for meaningful behavioral change, thereby raising questions about their effectiveness in driving substantial ESG enhancements.

We next explore market discipline by analyzing depositor responses to SLL issuance. Theoretically, ex-ante predictions remain equivocal: if SLLs serve as a credible signal of ESG commitment by the issuing bank, they should attract deposits via a reputational channel (Chen et al., 2023). Conversely, should depositors regard these instruments as "greenwashing" or mere superficial impression management, banks might confront disciplinary withdrawals (Auzepy et al., 2023).

Empirically, our analysis reveals that, on average, banks issuing SLLs experience net deposit outflows relative to peers originating conventional loans, implying an overall market-imposed penalty. Nevertheless, this aggregate effect conceals a pronounced temporal variation in market sentiment. Although early SLL issuances correlated with deposit inflows—thereby aligning with effective ESG signaling—subsequent cohorts experienced substantial outflows. This inversion signals that early market enthusiasm has yielded to mounting skepticism, potentially driven by growing concerns about greenwashing and inadequate enforcement of sustainability objectives.

Finally, we shed light on the supply-side drivers of SLL origination by delineating three distinct mechanisms that underpin bank participation. First, we document evidence of economies of scale: issuance is predominantly concentrated among larger institutions equipped with the operational capacity to navigate the structural intricacies of performance-contingent debt. Second, strategic alignment emerges as a pivotal factor—banks that embrace explicit organizational ESG commitments exhibit a markedly higher propensity to issue SLLs. Third, we underscore the significance of informational advantages: entrenched lending relationships robustly forecast SLL issuance, implying that banks leverage proprietary soft information to offset the elevated monitoring and verification costs inherent in these instruments.

Our study contributes to the burgeoning literature on SLLs, which has predominantly examined borrower-centric dimensions such as sustainability performance, pricing incentives, and contractual architectures. Aleszczyk et al. (2024) demonstrate that SLLs are disproportionately allocated to borrowers exhibiting low ex-ante ESG risk, frequently incorporating immaterial key performance indicators (KPIs) and lenient targets that inadequately address substantive ESG exposures. Echoing this, Kim et al. (2025) reveal that SLLs are commonly extended to firms with

robust pre-issuance ESG profiles, while underscoring the role of information asymmetry: high-transparency borrowers sustain their ESG trajectories, whereas low-transparency counterparts often regress post-origination, implying a signaling function over genuine reform. In contrast, other studies provide evidence of positive treatment effects. Dursun-de Neef, Ongena, and Tsonkova (2023) report ESG score enhancements following sustainable debt issuance in Europe, encompassing SLLs. Carrizosa and Ghosh (2023) present a balanced view, identifying certain SLL designs that foster tangible ESG progress alongside others indicative of superficial compliance.

Complementing these borrower-oriented insights, a nascent strand of research explores supply-side dynamics of banks' ESG commitments (not necessarily through SLL). Amiram et al. (2023) examine lenders' adoption of the Equator Principles—a voluntary ESG risk framework—revealing reduced loan spreads for committed borrowers and heightened environmental covenants, signaling credible sustainability pledges. Relatedly, Chen et al. (2023) document depositors' sensitivity to banks' social performance, with negative ratings precipitating deposit outflows that redirect toward high-performing peers, especially in trust-rich or opaque environments. Our analysis advances this literature by disentangling selection versus treatment effects in SLL risk profiles, tracing the temporal evolution of depositor discipline amid greenwashing scrutiny, and elucidating origination mechanisms tied to bank scale, executive incentives, and relational lending—collectively illuminating lenders' role in shaping the authenticity and efficacy of ESG finance.

Our study distinguishes itself from prior work by centering on the supply side of the SLL market. By examining banks' economic motivations for originating these contracts and the resulting performance implications, we make several pivotal contributions. First, we provide new empirical evidence that banks deploy SLLs primarily as a strategic risk-management instrument

rather than as a vehicle for impact-oriented investing. We establish that SLLs are preferentially allocated to borrowers boasting stronger ex-ante credit profiles, and that this selective process culminates in markedly reduced ex-post default rates. Subsequent scrutiny reveals that these favorable outcomes stem predominantly from banks' risk-informed borrower screening rather than from the inherent disciplinary power of the loan contract—thereby challenging the potency of SLL contractual elements in fostering genuine sustainability advancements (Auzepy et al., 2023; Carrizosa and Ghosh, 2023).

Second, we illuminate the mechanisms of market discipline and the shifting paradigms within sustainable finance. To our knowledge, this is the first empirical study to delineate time-varying depositor reactions to banks' engagement in sustainable lending practices. In particular, our findings reveal that deposit inflows concomitant with early SLL issuances subsequently invert into outflows in later periods, emblematic of escalating stakeholder skepticism regarding the veracity and robustness of ESG commitments—dynamics that underscore the fragility of perceived credibility in this domain (Chen et al., 2023; Auzepy et al., 2023).

Third, we delve into the heterogeneous drivers underpinning SLL origination, thereby advancing our understanding of the multifaceted incentives that propel banks into this domain. By pinpointing the distinct contributions of economies of scale—manifested through banks' operational capacity to handle complex performance-linked structures—organizational ESG commitment, as proxied by the integration of sustainability metrics into executive compensation schemes, and informational advantages derived from entrenched lending relationships that facilitate superior monitoring and verification, we provide a nuanced perspective on the supply-side factors molding the sustainable debt landscape.

The remainder of the paper is organized as follows. Section 2 provides institutional background and outlines the testable hypotheses. Section 3 describes the data, sample, and summary statistics. Section 4 examines banks' incentive-driven selection processes in extending SLLs to borrowers. Section 5 evaluates the post-issuance performance dynamics of SLL-issuing banks, focusing on depositor responses and temporal shifts. Section 6 explores the mechanisms driving SLL origination. Section 7 concludes.

## 2. Institutional Background: Sustainability-linked Loans

Sustainability-Linked Loans (SLLs) represent an innovative debt financing mechanism designed to encourage borrowers to advance their sustainability agendas by tying loan conditions—most notably interest margins or commitment fees—to the fulfillment of predetermined Key Performance Indicators (KPIs). These KPIs can draw from bespoke internal benchmarks tailored to the borrower's operations or from externally validated frameworks aligned with global sustainability standards, such as those linked to the United Nations Sustainable Development Goals (SDGs) (Auzepy et al., 2023; Carrizosa and Ghosh, 2023). Unlike green loans, which restrict proceeds to specific environmentally beneficial projects, SLLs offer flexibility in fund usage, functioning as general-purpose instruments that embed sustainability incentives directly into pricing structures, thereby promoting broader ESG integration without earmarking capital.

The overarching governance for SLLs is provided by the Sustainability-Linked Loan Principles (SLLP), which were collaboratively developed by prominent industry bodies, including the Loan Market Association (LMA), the Asia Pacific Loan Market Association (APLMA), and the Loan Syndications and Trading Association (LSTA). First introduced in 2019 and revised

periodically—most recently in March 2025—these principles outline five core components to ensure credibility and impact: (1) selection of KPIs that are relevant, material, and ambitious to the borrower's business; (2) calibration of Sustainability Performance Targets (SPTs) that set measurable, time-bound thresholds negotiated in good faith and benchmarked against industry peers or historical performance; (3) loan characteristics specifying how achievement or failure against SPTs triggers pricing adjustments, typically in the form of margin reductions (rewards) or increases (penalties); (4) transparent reporting requirements, mandating annual disclosures of KPI progress to lenders; and (5) independent verification, often through external reviewers, to validate performance data and mitigate greenwashing risks (Loan Market Association, 2023b; Loan Market Association, 2023a). The 2025 updates emphasize greater ambition in SPTs, a stronger focus on materiality assessments, and strengthened guidance on external reviews to bolster market integrity amid rapid growth and scrutiny (LMA et al., 2025).

A key aspect of SLL architecture involves precisely calibrating SPTs for each KPI, ensuring they remain relevant and challenging throughout the loan's duration. An example is the Italian utility Enel S.p.A., which links its interest margin to the reduction in the intensity of direct (Scope 1) CO2 emissions. In this framework, the emissions intensity serves as the KPI, while the specific objective—reducing intensity to less than 148g CO2eq/kWh by 2023—constitutes the SPT.[2] Similarly, BlackRock's landmark $4.4 billion revolving credit facility, signed in 2021, exemplifies socially oriented SLLs by conditioning pricing on workforce diversity KPIs.[3] The SPTs mandated a 3% annual uplift in female representation at senior leadership levels and a 30%

[2] For further details, refer to https://www.enel.com/investors/investing/sustainable-finance/sustainability-linked-finance (Sustainability-Linked Financing Framework 2021)
[3] For further details, refer to https://www.bankingdive.com/news/blackrock-bets-its-interest-rate-on-esg-progress/597973/

expansion in the proportions of Black, African American, Hispanic, and Latino employees by 2024, highlighting the instrument's versatility in addressing governance and inclusivity dimensions.[4]

## 3. Data, Sample, and Descriptive Statistics

### *3.1. Data and sample*

Our data on SLLs and other types of loans are drawn from Thomson/Refinitiv LoanConnector Dealscan (formerly LPC Dealscan), which provides comprehensive coverage of the global commercial loan market. A loan facility is classified as an SLL if it falls under the "Environmental, Social & Governance/Sustainable Linked" market segment. In line with established practices in the literature, our analysis centers on lead arrangers. A bank is designated as a lead arranger for a given loan if (i) it appears in DealScan's Lead Arranger field, or (ii) its reported Primary Role or Additional Roles includes any lead-related designation such as: lead bank, lead manager, administrative agent, agent, bookrunner, arranger, coordinating arranger, lead arranger, mandated arranger, or mandated lead arranger. The resulting sample encompasses 5,600 SLL facilities across 2,993 unique deals, originated by banks headquartered in 73 countries, spanning January 2016 to December 2024.

We retrieve lenders' financial statement data from the Compustat Bank Fundamentals Annual database. To integrate borrower details, we match DealScan borrower firms to Compustat using the linking table developed by Chava and Roberts (2008), as updated and maintained by Michael Roberts, supplemented by manual verification for borrower names not captured automatically. Similarly, DealScan lenders are mapped to Compustat Bank entities using the

[4] For comprehensive details regarding these contractual terms, refer to the relevant SEC filing: https://d18rn0p25nwr6d.cloudfront.net/CIK-0001364742/5e4dda7a-f2a1-4651-b645-825682ec946d.pdf.

lender-linking table provided by Schwert (2018), which is then augmented with manual checks to enhance accuracy and completeness.

Data on borrowers' probability of default and distance-to-default metrics are from the Credit Research Initiative at the National University of Singapore, a resource widely employed in credit risk assessments. Credit ratings for global firms are retrieved from S&P Capital IQ RatingsDirect. Global equity returns and characteristics are drawn from the comprehensive dataset compiled by Jensen, Kelly, and Pedersen (2023). Data on ESG-linked executive compensation metrics are obtained from ISS Incentive Lab's Executive Compensation Analytics module. Detailed definitions for all variables are provided in Appendix A.

### *3.2. Descriptive statistics*

Panel A of Table 1 presents the annual issuance volumes for sustainability-linked loans (SLLs). The market began modestly at $6.21 billion in 2016, growing steadily in the years that followed. Issuance volumes peaked in 2021, after which a discernible downward trend emerged. Furthermore, Panel A illustrates the SLL market's share relative to the overall corporate loan market, starting at 0.11% in 2016, rising to 9.75% by 2021, and then declining in subsequent periods. By 2024, SLLs represented 3.76% of total loan issuance. The concluding column details the average proportion of SLLs within a lender's loan portfolio, computed as the ratio of a lender's total SLL issuance in a given year to its aggregate corporate loan issuance for that year; this measure likewise rises through 2021 before receding thereafter.

[Table 1]

A plausible rationale for the swift initial surge and ensuing contraction in the SLL segment lies in the intensifying examination of potential greenwashing practices. At the outset, SLLs were heralded as a groundbreaking mechanism for tethering loan pricing to corporations' sustainability

achievements, fostering alignment between financial incentives and ESG imperatives. Yet, as adoption proliferated, skepticism has mounted regarding the extent to which these vehicles genuinely elevate borrowers' substantive ESG performance, augment enterprise value, or attenuate systemic risks—particularly amid evidence of stagnant or regressive outcomes post-issuance. The instruments' efficacy critically depends on the judicious selection of key performance indicators (KPIs) that are material, ambitious, and externally verifiable, alongside robust monitoring and enforcement protocols—domains where stakeholders, including investors, lenders, and supervisory authorities, have voiced persistent apprehensions over lax standards, opaque reporting, and insufficient penalties for non-attainment. This evolving discourse, amplified by regulatory interventions and litigation trends, underscores a maturation process in the market, wherein early enthusiasm has yielded to demands for greater transparency and demonstrable impact to sustain credibility.

The literature underscores enduring challenges in the SLL domain, encompassing definitional ambiguity surrounding sustainability metrics, divergent ESG priorities across stakeholders, and the inherently subjective evaluation of ESG advancements—issues that complicate the formulation of robust, enforceable targets (Aleszczyk et al., 2024; Carrizosa and Ghosh, 2023). As the market has evolved, investors and lenders have grown increasingly attuned to these constraints, prompting a reevaluation of SLLs' purported benefits amid evidence of varying contractual rigor and limited post-issuance impact (Kim et al., 2025). This heightened vigilance, coupled with amplified regulatory oversight of greenwashing vulnerabilities—such as

deferred or immaterial KPIs—would be expected to reduce interest in SLL issuance, thereby explaining the observed contraction in issuance volumes after the early boom.[5]

Panel B of Table 1 summarizes three measures of lending relationships in the context of SLL issuance: Relationship Number, Relationship Length, and Cumulative Loan Amount. Relationship Number captures the total number of loan contracts between a borrower–lender pair prior to the focal loan. The mean (median) value is 4.09 (2). Relationship Length measures the number of years elapsed since the pair's first loan. The mean (median) relationship length is 8.96 (6.67) years. Cumulative Loan Amount is the total amount the bank has lent to the borrower across all prior loan facilities. The mean (median) cumulative amount is approximately $6 billion ($1.53 billion).

## 4. Incentive-Driven Borrower Selection in SLL Issuance

In this section, we examine lenders' incentives to issue SLLs, with a particular focus on the role of borrower risk. We begin by analyzing whether banks preferentially extend SLLs to safer borrowers to mitigate credit risk. To capture ex-ante borrower risk, we use three standard measures: probability of default, S&P credit ratings, and distance-to-default. We then turn to ex-post borrower credit outcomes—default, downgrade, and upgrade—to assess whether subsequent credit events differ between SLL and non-SLL groups. Finally, we probe whether any post-issuance credit differentials arise from inherent borrower attributes (namely, creditworthiness) or embody the causal influence of SLL issuance itself.

[5] Panel A of Table 1 shows that the dynamics of the SLL market have changed substantially over time. Table 7 provides evidence consistent with this pattern: while SLL issuance is initially associated with positive market reactions—reflected in higher bank deposit growth—this relationship reverses in later years. These evolving dynamics suggest that the market's perception and valuation of SLLs are not static. Understanding the underlying drivers and broader implications of these temporal changes offers a promising direction for future research.

For this analysis, we construct a matched sample (Main Sample), in which non-SLL borrowers are firms in the same country and industry (based on the Major Industry Group classification in Refinitiv LoanConnector/DealScan) and loan origination year that issued a loan in that year but did not use an SLL.[6] As a robustness check, we also construct an alternative sample (Alternative Sample) that excludes all borrowers who have ever used an SLL during the sample period from the non-SLL group in the Main Sample. To compare the probability of default (PD) between SLL borrowers and their matched non-SLL peers, we estimate the following regression specification:

$$SLL_{i,t} = \alpha + \beta \cdot PD_{i,t-3} + \zeta_b + I_{Ind} + \theta_t \ (or\ \zeta_b * \theta_t + I_{Ind} * \theta_t) + \varepsilon_{i,t} \quad (1)$$

The dependent variable, $SLL_{i,t}$, equals one for SLL loans and zero for matched non-SLL loans. The key independent variable is the borrower's probability of default measured three months prior to the initiation of the loan contract. PD is computed over multiple forward-looking horizons ranging from 3 to 60 months.[7] The model includes borrower-country ($\zeta_b$), borrower-industry ($I_{Ind}$), and loan-year ($\theta_t$) fixed effects, as well as country-year and industry-year interactions (Ongena, Popov, Udell, 2013). Standard errors are clustered by borrower and year. If banks selectively issue SLLs to lower-risk borrowers, the coefficient $\beta$ is expected to be significantly negative.

[Table 2]

Table 2 reports the estimation results. Panel A presents coefficients based on the Main Sample, and Panel B shows results for the Alternative Sample. Across all specifications, the

[6] The empirical design employs a matched-sample approach, limiting the control group to non-SLL borrowers active in the syndicated corporate loan market. Grounded in foundational banking and finance literature (e.g., Diamond, 1984, 1991; Berger and Udell, 1995; Petersen and Rajan, 1994; Stiglitz and Weiss, 1981), this strategy controls for key determinants of external financing—loan demand, credit access, and lender supply. By focusing on firms with comparable borrowing activity and institutional financing options, the analysis isolates the impact of the SLL contract from broader credit market dynamics.

[7] For details of the PD measure, https://d.nuscri.org/static/pdf/Probability%20of%20Default%20White%20Paper.pdf

coefficient on the PD measure is negative and statistically significant, indicating that banks are more likely to issue SLLs to borrowers with lower ex-ante default risk. For example, the coefficient of –3.899 in Column 1 of Panel A implies that a one-percentage-point increase in default probability reduces the likelihood of receiving an SLL by approximately 3.9 percentage points. This pattern is consistent with the assumption that SLLs—because they involve greater structural complexity, KPI calibration, sustainability verification, and external review—are more costly to administer than conventional loans. These additional monitoring and compliance burdens give banks strong incentives to direct SLLs toward financially sound borrowers who are less likely to default and better equipped to meet ongoing reporting and performance requirements.

For robustness, we re-estimate the Table 2 analysis using two alternative measures of borrower credit risk: S&P long-term credit ratings and distance-to-default (Merton, 1974). The S&P rating variable is coded such that AAA = 23, AA+ = 22, and so on, with larger values indicating better credit quality. When multiple observations share the same *gvkey* and *ratingdate*, we retain the lowest (i.e., worst) rating. Because an S&P rating remains in effect from its rating date until the day before the next revision, we construct a monthly time series of credit scores for each firm. In months with a rating change, we calculate a day-weighted average of the old and new ratings. For example, if a firm's rating shifts from A+ (19) to A– (17) on November 21, 2024, its November score is 18.33 (= ((19×20) + (17×10)) / 30).

Distance-to-default is interpreted similarly to the S&P rating measure: higher values correspond to a lower likelihood of default. The regression specifications reported in Table 3 mirror those in Table 2, with the sole difference that the key independent variable—the probability of default—is replaced by the alternative borrower risk measures, namely the S&P credit rating and distance-to-default.

[Table 3]

Table 3 reports the results. Columns 1–4 present estimates using the numeric S&P credit rating, and Columns 5–8 report regressions based on distance-to-default. Across all specifications, the coefficient on the S&P rating measure is significantly positive, indicating that SLLs are more likely to be issued to borrowers with higher credit quality. The distance-to-default results show a similarly consistent pattern. Together, these robustness tests reinforce the conclusion that SLL issuance is strongly tied to lenders' risk-management incentives, with banks systematically favoring safer borrowers.

Next, we assess whether banks' risk-based selection of SLL borrowers translates into observable reductions in credit risk. Specifically, we compare the incidence of defaults, downgrades, and upgrades over the life of the loan between SLL borrowers and their matched non-SLL counterparts. The regression model is:

$$Default\ (Downgrade, Upgrade)_{i,j,t} = \alpha + \beta \cdot SLL_{i,j,t} + \zeta_b + I_{Ind} + \theta_t\ (or\ \zeta_b * \theta_t + I_{Ind} * \theta_t) + \varepsilon_{i,j,t} \quad (2)$$

*Default* is defined as an indicator equal to one if a borrower's S&P long-term credit rating is downgraded to "D" or "SD" at any point during the loan period, and zero otherwise. *Downgrade* is a binary variable equal to one if the borrower experiences any credit rating downgrade over the life of the loan, while *Upgrade* is defined analogously, taking the value of one when the borrower receives any rating upgrade during the loan period. All remaining model specifications in Equation (2) follow those in Equation (1).

[Table 4]

Table 4 reports the results. Consistent with the preceding analyses, Panel A presents estimates based on the Main Sample, while Panel B uses the Alternative Sample. Columns 1–6 examine default outcomes, Columns 7–8 report downgrade results, and Columns 9–10 present upgrade outcomes. The coefficients on the SLL indicator are significantly negative for the default measures, indicating that banks issuing SLLs experience a lower likelihood of borrower credit deterioration over the life of the loan.

Overall, the evidence in Tables 2–4 indicates that sustainable lending practices are tightly linked to credit-risk considerations: SLLs are granted to safer borrowers at origination and are associated with reduced borrower risk afterward. Yet it is unclear whether these post-issuance patterns stem from banks selectively lending to already safer borrowers or from a true SLL treatment effect in which contract features improve subsequent credit performance. The next analysis seeks to disentangle these channels.

To separate selection from treatment effects, we extend the default analysis in Table 4 by explicitly controlling for borrowers' ex-ante credit quality. In particular, we incorporate each borrower's S&P long-term credit rating measured three months prior to origination. Conditioning on this pre-issuance credit-risk measure holds borrowers' initial credit profiles constant at the time of the lending decision, allowing a cleaner assessment of whether post-issuance outcomes reflect borrower selection or the SLL contractual structure itself.

[Table 5]

Table 5 shows that the coefficient on the SLL indicator becomes statistically insignificant once borrowers' ex-ante credit ratings are included, whereas the S&P credit rating remains strongly significant across all specifications. This pattern suggests that the lower credit risk observed after SLL issuance is largely attributable to selection—banks extending SLLs to

borrowers with stronger initial credit profiles—rather than to any improvement induced by the loan's contractual features. Although SLLs are intended to motivate sustainability performance through mechanisms such as pricing adjustments, their apparent effect dissipates after controlling for borrowers' baseline creditworthiness.[8] Taken together, the results imply that SLLs may operate primarily as a screening or labeling device rather than as an instrument that materially alters borrower behavior.

These findings also highlight banks' strategic approach to sustainable lending. Rather than targeting firms for which sustainability-linked incentives could plausibly induce meaningful improvements, banks appear to direct SLLs toward borrowers that already exhibit low credit risk, consistent with prudent risk-management motives. Consequently, a portion of SLL activity may represent the rebranding of financially stable borrowers as "sustainable," with limited indication that these loans generate substantive environmental or social impact.

## 5. Performance Dynamics of Banks Issuing SLLs

In this section, we analyze how SLL issuance affects bank performance, focusing specifically on annual deposit growth. Deposit flows are a central determinant of bank value, liquidity, and overall financial stability (Diamond and Dybvig, 1983; Kashyap, Rajan, and Stein, 2002; Egan et al., 2025), making them a natural outcome through which to assess market reactions to sustainable lending.

Importantly, prior research suggests that depositors react not only to pricing considerations but also to broader, non-pecuniary signals about bank behavior. Homanen (2018), for example, shows that banks involved in financing the controversial Dakota Access Pipeline experienced

[8] Prior research suggests that sustainability improvements can enhance firm performance (Albuquerque, Koskinen, and Zhang, 2017; Hoepner, Oikonomou, Sautner, Starks, and Zhou, 2024).

sizable deposit withdrawals, indicating that depositors discipline banks based on information extending beyond conventional financial fundamentals. Within this context, deposit flows provide a direct, revealed-preference measure of market perception. If SLL issuance conveys a credible commitment to ESG principles, it may attract deposits; conversely, if viewed as greenwashing, it may prompt deposit outflows.[9]

For the primary analysis, we construct a matched sample in which the control group consists of banks that did not issue an SLL but originated a loan in the same country and year as SLL lenders. To enhance identification, we further implement a robustness check using an alternative sample that removes from the control group any bank that issued an SLL at any point during the sample period. This design yields a cleaner distinction between SLL and non-SLL banks, thereby improving causal inference by reducing contamination from prior or future SLL activity—though at the expense of a smaller comparison sample. The empirical analysis is estimated using the following regression specification:

$$Growth\_Deposit_{j,[t-3,t+3]} = \alpha + \beta SLL_{j,t} \cdot Post_t + \gamma SLL_{j,t} + \eta_l + \theta_t + \chi_j + \varepsilon_{j,t} \qquad (3)$$

The dependent variable is annual deposit growth, measured using three Compustat items: total domestic deposits (TDOMD), customer demand deposits (DPDC), and customer savings deposits (DPSC). The variable Post equals one for observations within the three years following SLL issuance and zero for observations within the three years preceding issuance. Deposit growth corresponding to the SLL issuance year is excluded from the analysis. We control for unobserved

[9] The following articles illustrate the channels through which information regarding SLL issuance is disseminated to the market, specifically via press releases and media coverage:
1) https://www.abladvisor.com/news/34162/jpmorgan-chase-bank-agents-1-75b-sustainability-linked-abl-credit-facility-for-u?utm_source=chatgpt.com;
2) https://www.businesswire.com/news/home/20210928005051/en/HSBC-Brings-First-of-its-Kind-Sustainable-Finance-Product-Suite-to-Canadian-Businesses;
3) https://group.bnpparibas/en/press-release/bnp-paribas-grants-the-first-inclusive-sustainability-linked-financing-to-three-major-microfinance-players-in-france-italy-and-brazil?utm_source=chatgpt.com.

heterogeneity using fixed effects for the lender country ($\eta_l$), year ($\theta_t$), and lender ($\chi_j$), respectively. Standard errors are clustered by lender and year.

[Table 6]

The coefficient on the interaction term in Table 6 is significantly negative, indicating that SLL-issuing banks experience a reduction in deposit inflows relative to non-SLL banks. As shown in Table 6, the significantly negative coefficient on the interaction term reveals that SLL-issuing banks experience a decline in deposit inflows relative to their non-SLL counterparts. This pattern supports the hypothesis that the market interprets SLL issuance as a negative signal, prompting depositors to withdraw funds or curb new deposits.[10]

The validity of the DiD approach hinges on the parallel trends assumption. To investigate this, we compute the mean deposit growth for both SLL and non-SLL lenders across the [-3, +3] event window surrounding SLL issuance. Crucially, the SLL issuance year (t=0) is excluded from the estimation to mitigate the influence of contemporaneous noise and ensure a cleaner separation between the pre- and post-treatment effects.

[Figure 1]

Figure 1 illustrates this comparison by plotting the average difference in deposit growth between the two groups. Prior to SLL issuance, the gap in mean deposit growth is negligible, providing strong support for the parallel-trends assumption. This pattern indicates that treated and control banks followed similar trajectories before the intervention, allowing the subsequent

[10] In Table A.1, we analyze the post-issuance loan performance of SLL-issuing banks, specifically focusing on domestic commercial and industrial loans (Compustat item: LCACLD) and consumer loans (LCACRD). Although the coefficient on the interaction term is negative, it is not statistically significant. A plausible explanation for this outcome lies in the characteristics of SLL-issuing banks, as detailed in Table 8. These institutions tend to be larger and possess sizable market shares, suggesting they are less reliant on core deposits and have superior access to alternative funding sources. Consequently, they face less immediate pressure to adjust their lending standards or volume in response to deposit dynamics, which ultimately attenuates any measurable impact of SLL issuance on loan growth.

divergence in deposit growth to be credibly attributed to the effect of SLL issuance. As such, the identifying assumption underlying the DiD design holds in our setting, reinforcing confidence in the estimated treatment effects.

The pre-intervention patterns in Figure 1 also shed light on banks' motivations for issuing SLLs. The parallel trajectories prior to issuance indicate that SLLs are not introduced in response to deteriorating performance, ruling out the possibility that banks adopt SLLs as a short-term corrective measure. Moreover, the lack of a positive, significant increase in deposit growth following issuance challenges the view that SLLs confer a competitive advantage. Although a credible ESG commitment could, in principle, attract deposits from sustainability-minded clients, the observed decline implies that any such benefit is minimal or outweighed by negative market perceptions—for example, heightened concerns about greenwashing.

In the next analysis, we investigate how market responses to SLL issuance have changed over time. In the early years, SLLs were perceived as a financial innovation, and their issuance may have functioned as a credible signal of ESG leadership. As the market matured, however, this signaling value may have weakened. Market reactions could plausibly have evolved in several ways—dampening as SLLs became more commonplace, turning negative amid heightened greenwashing concerns, or improving in response to stronger standards and increased transparency. The following analysis examines these dynamics to understand how the credibility of sustainable finance instruments has evolved over time.

[Table 7]

Using total domestic deposits (TDOMD) as the outcome variable, we trace the evolution of market responses to SLL issuance by sequentially expanding the sample by SLL cohort year. Column 1 of Table 7 includes only the 2016–2017 SLL cohorts and their matched controls. Each

subsequent column adds the next cohort year—for example, Column 2 includes all cohorts from 2016 through 2018—and continues cumulatively through Column 8, which includes all SLL issuances through 2024. By construction, the coefficient in Column 8 matches the full-sample estimate reported in Table 6, providing an internal consistency check. All remaining model specifications, including fixed effects and the definition of the post-issuance window, follow those used in Table 6.

The results in Table 7 reveal a clear evolution in market perceptions of SLLs. For the early cohorts, SLL issuance is associated with significant inflows of deposits, suggesting that the market initially viewed these instruments as a credible ESG innovation. In contrast, this pattern reverses in later cohorts, where SLL-issuing banks experience pronounced deposit outflows. This shift likely reflects growing market skepticism—driven by heightened concerns about greenwashing or eroding confidence in the credibility of ESG-linked financial products.[11]

## 6. Issuance Mechanisms

This section investigates the mechanisms that drive SLL issuance, focusing on three dimensions: bank size and market share, executive compensation structures, and the depth of lending relationships.

### *6.1. Bank size*

Compared with conventional loans, SLLs involve substantially greater structuring complexity. They require the specification of ESG Key Performance Indicators (KPIs) and

[11] In Table A.2, we conduct a robustness check by partitioning the main matched sample into two distinct SLL cohort groups: 2016–2020 and 2021–2024. We run the same deposit flow analysis as employed in Table 6 to investigate the market's response around SLL issuance for each subgroup. Consistent with the dynamic results presented in Table 7, we find that the market reaction to the earlier cohorts (2016–2020) was positive, while a contrasting negative result emerges for the later cohorts (2021–2024). This time-varying pattern also holds when using the alternative sample, where the control group excludes any bank that issued an SLL during the sample period.

measurable, verifiable Sustainability Performance Targets (SPTs), which in turn determine pricing adjustments through interest rate discounts or penalties. This design imposes meaningful operational and compliance costs, driven by the need for ongoing third-party verification, monitoring, and reporting. Larger banks are better equipped to absorb these costs, as they typically possess the organizational infrastructure and specialized expertise necessary to structure and manage complex ESG-linked contracts more efficiently than smaller institutions.

Beyond operational capacity, large banks also face greater scrutiny from stakeholders and stronger expectations to demonstrate credible ESG engagement. Active participation in the SLL market enables these institutions to signal leadership in sustainable finance—particularly in the market's early years, when concerns about greenwashing were less pronounced, and ESG signaling carried substantial reputational value. Taken together, these considerations suggest that larger banks are more likely to issue SLLs.

$$SLL_{j,t} = \alpha + \beta \cdot Y_{j,t-1} + \eta_l + \theta_t \ (or\ \eta_l * \theta_t) + \varepsilon_{j,t} \qquad (4)$$

The dependent variable, *SLL*, is an indicator equal to one for banks that issue at least one SLL in a given year and zero for matched banks that issue only non-SLL loans. The key explanatory variables ($Y$) are indicators for banks with relatively larger market capitalization or greater corporate lending market share, measured in the year immediately preceding SLL issuance. Based on the preceding discussion, we expect the estimated coefficients on these variables ($\beta$) to be significantly positive. Model specifications include lender country ($\eta_l$) and year ($\theta_t$) fixed effects, as well as country-year interactions. Standard errors are clustered at the lender and year levels.

[Table 8]

Table 8 reports the results. Columns 1–6 present specifications based on market capitalization, while Columns 7–12 use market share as the size proxy. Across all models and sample constructions, the coefficients on the bank size measures are uniformly positive and statistically significant at the 1% level. These findings indicate that larger banks are more likely to issue SLLs, consistent with their greater ability to absorb the structuring and monitoring costs associated with ESG-linked contracts and their superior organizational infrastructure for managing such complexity.[12]

### *6.2. Bank executives' compensation*

Next, we analyze whether the adoption of ESG metrics in executive compensation affects a bank's propensity to issue SLLs. Information on compensation structures is obtained from ISS ESG's Executive Compensation Analytics. We identify ESG-linked incentives by classifying the *OVERALL_METRIC_TYPE* into the categories "CSR," "SOCIAL," or "ENVIRONMENT." For each bank, we determine the first year in which an ESG metric appears in its compensation package and then assess whether the likelihood of issuing SLLs increases following this initial adoption.

No individual compensation metric explicitly requires banks to issue SLLs. Accordingly, we interpret the first adoption of any ESG-related metric in executive pay as a bank-level signal of broader organizational commitment to ESG principles, rather than as a direct incentive to originate SLLs. Our empirical analysis proceeds using the following regression specification:

$$SLL_{j,t} = \alpha + \beta \cdot Post\_FirstESGPay_{j,t} + \eta_l + \chi_j + \varepsilon_{j,t} \qquad (5)$$

The dependent variable equals one for SLLs and zero for non-SLL loans. The key independent variable, *Post_FirstESGPay*, is an indicator set to one for loan contracts originated

[12] In our main sample, measured in the year preceding SLL issuance, SLL-issuing banks exhibit an average market capitalization of $36.07 billion and a total loan volume of $368.25 billion. In contrast, non-SLL-issuing banks are considerably smaller, with an average market capitalization of $12.00 billion and $70.63 billion in total loans.

after the fiscal year-end in which a bank first adopts ESG-linked performance metrics in executive compensation, and zero otherwise. For banks that never introduce such metrics, the indicator remains zero for all observations. All regressions include lender country ($\eta_l$) and lender ($\chi_j$) fixed effects. Standard errors are clustered at both the bank and year levels.

[Table 9]

Table 9 presents the main results. Columns 1 and 4 incorporate all ESG-related compensation metrics (CSR, environmental, and social), while Columns 2 and 5 isolate environmental metrics, and Columns 3 and 6 focus on social metrics. Across all specifications, the coefficient on *Post_FirstESGPay* is consistently positive and statistically significant. This evidence suggests that changes in executive pay structures are linked to greater subsequent use of SLLs, but given the largely weak and non-binding nature of these contracts, such use may reflect symbolic ESG alignment rather than meaningful changes in lending practices.[13]

### *6.3. Lending relationship*

We conjecture that long-standing lending relationships facilitate SLL origination by reducing information asymmetry and related agency costs. Through repeated interactions, banks accumulate private information about a borrower's operations and genuine commitment to sustainability, thereby lowering the substantial due diligence costs associated with underwriting complex ESG-linked structures. This informational advantage helps mitigate adverse selection risk—namely, the risk of extending SLLs to borrowers who lack the ability or intent to meet Sustainability Performance Targets (SPTs). Moreover, because SLLs require continuous

[13] In Table A.3, we estimate alternative specifications to assess whether executives' compensation incentives affect the likelihood of SLL issuance. The key explanatory variable, *ESGPay*, is defined as an indicator equal to one in fiscal years when ESG-related performance metrics are incorporated into executive compensation and zero otherwise. Across all models, our baseline findings remain robust, indicating that the inclusion of ESG-linked pay is consistently associated with a higher probability of issuing SLLs.

monitoring to implement performance-based pricing adjustments, the established information channels in relationship lending make this oversight considerably more efficient. Accordingly, we expect the likelihood of SLL issuance to be positively associated with the strength and duration of prior bank–borrower relationships.

To capture the strength of lending relationships, we construct three measures based on the borrower–lender transaction history prior to the focal loan: (1) *Relationship Number*, the cumulative count of previous loan contracts between the pair; (2) *Relationship Length*, the number of years since their first recorded loan; and (3) *Ln(Cumulative Loan Amount)*, the natural logarithm of the total loan volume previously extended by the lender to the borrower. Higher values of these variables reflect deeper and more established banking relationships. We incorporate these measures into the following regression specification to assess whether relationship strength predicts the likelihood of SLL issuance:

$$SLL_{i,j,t} = \alpha + \beta \cdot Z_{i,j,t-1} + \zeta_b + \eta_l + I_{Ind} + \nu_{i,j} + \varepsilon_{i,j,t} \quad (6)$$

The dependent variable is a binary indicator equal to one for SLLs and zero otherwise. The key independent variables, $Z_{i,j,t-1}$, are the lending relationship proxies defined above. All regressions include borrower–lender pair ($\nu_{i,j}$) fixed effects, along with fixed effects for borrower country ($\zeta_b$), lender country ($\eta_l$), and borrower industry ($I_{Ind}$). Standard errors are clustered at both the borrower and lender levels.

[Table 10]

Table 10 shows that all proxies for lending relationships—frequency, duration, and cumulative loan volume—are positive and statistically significant at the 1% level across all specifications. These results indicate that established borrower–lender relationships play an important role in facilitating SLL issuance. The findings support the hypothesis that deeper

relationships provide informational advantages and cost efficiencies, which are particularly valuable given the complexity and monitoring demands of sustainability-linked lending.

## 7. Concluding Remarks

This study provides new evidence on the economic forces that shape the sustainability-linked loan market, revealing that SLL issuance is driven less by transformational intent and more by strategic risk management. The consistent pattern of banks extending SLLs to borrowers with superior ex-ante credit profiles underscores a dominant selection effect. Although SLL borrowers exhibit lower ex-post default rates, these apparent benefits disappear once initial credit quality is accounted for. The results challenge the prevailing narrative that SLLs materially enhance borrower behavior and instead suggest that the instrument frequently functions as a labeling mechanism for already-safe borrowers.

Our analysis of market perception further highlights the evolving fragility of credibility in sustainable finance. Early SLL issuances attracted deposits, reflecting an initial belief in the promise of performance-linked sustainability commitments. Yet, as concerns about greenwashing intensified and scrutiny increased, this optimism gave way to skepticism: more recent SLL cohorts correspond to significant deposit outflows. These dynamics demonstrate that stakeholders increasingly differentiate between substantive ESG engagement and symbolic adoption, and penalize banks when the credibility of such instruments is called into question.

Finally, we show that SLL origination is concentrated among banks with the structural, organizational, and informational capacity to manage the complexity of ESG-contingent lending. Large institutions, banks with explicit ESG commitments, and lenders embedded in long-standing borrower relationships are all disproportionately represented in SLL issuance. These patterns

suggest that the supply of SLLs reflects not only ESG aspirations but also economic incentives tied to scale, governance, and relational capital.

Taken together, our findings reframe the role of SLLs within the sustainable finance ecosystem. Rather than serving as uniform catalysts for behavioral change, SLLs appear to operate within a strategic, and increasingly scrutinized, equilibrium—one in which selection, credibility, and institutional capability play defining roles. Understanding these dynamics is critical for policymakers, investors, and market participants seeking to design ESG instruments that are both economically grounded and authentically impactful.

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## Appendix A: Definitions of Variables

| Variable | Definition | Data Source |
|---|---|---|
| Loan Amount | Loan (facility) amount | Refinitiv LoanConnector Dealscan |
| Relationship Number | The cumulative number of loan contracts between a borrower and a lender prior to the focal loan | Refinitiv LoanConnector Dealscan |
| Relationship Length | The number of years passed since the first loan initiated between a borrower and a lender | Refinitiv LoanConnector Dealscan |
| Ln(Cumulative Loan Amount) | The natural logarithm of the cumulative loan amount extended between a borrower and a lender since the initiation of their first lending relationship prior to the focal loan | Refinitiv LoanConnector Dealscan |
| TDOMD | Total domestic deposits | Compustat Bank |
| DPDC | Customer demand deposits | Compustat Bank |
| DPSC | Customer savings deposits | Compustat Bank |
| LCACLD | Commercial and industrial loans | Compustat Bank |
| LCACRD | Consumer loans | Compustat Bank |
| PD | The CRI Probability of Default. The model provides prediction horizons spanning from 1 month to 60 months. | NUS Credit Research Initiative |
| Distance-to-Default | Distance-to-Default based on Merton (1974) | NUS Credit Research Initiative |
| S&P Credit Rating | S&P credit rating (AAA = 23, AA+ = 22, …) | Capital IQ |
| Default (‘D’ & ‘SD’) | An indicator that equals 1 if, during the loan period, the borrower experiences an S&P credit rating downgrade to either D (Default) or SD (Selective Default), and 0 otherwise. | Capital IQ |
| Default (‘D’) | An indicator that equals 1 if, during the loan period, the borrower experiences an S&P credit rating downgrade to D (Default), and 0 otherwise. | Capital IQ |
| Default (‘SD’) | An indicator that equals 1 if, during the loan period, the borrower experiences an S&P credit rating downgrade to SD (Selective Default), and 0 otherwise. | Capital IQ |
| Downgrade | An indicator that equals 1 if the borrower experiences any credit rating downgrade during the loan period, and 0 otherwise. | Capital IQ |
| Upgrade | An indicator that equals 1 if the borrower experiences any credit rating upgrade during the loan period, and 0 otherwise. | Capital IQ |
| Post_FirstESGPay | An indicator equal to 1 for all loan contracts originated after the fiscal year-end in which a bank first adopts ESG-linked performance metrics in executive compensation, and 0 otherwise. | ISS ESG |
| ESGPay | An indicator equal to 1 in fiscal years when ESG-related performance metrics are incorporated into executive compensation, and zero otherwise. | ISS ESG |
| High Mkt Cap (Top 10) | An indicator that takes a value of 1 if a bank’s yearly market capitalization ranks within the top 10 worldwide, and zero otherwise. | Jensen, Kelly, and Pedersen’s data available on WRDS |
| High Mkt Cap (Top 20) | An indicator that takes a value of 1 if a bank’s yearly market capitalization ranks within the top 20 worldwide, and zero otherwise. | Jensen, Kelly, and Pedersen’s data available on WRDS |
| High Mkt Cap (Top 30) | An indicator that takes a value of 1 if a bank’s yearly market capitalization ranks within the top 30 worldwide, and zero otherwise. | Jensen, Kelly, and Pedersen’s data available on WRDS |
| High Mkt Share (above Q70) | An indicator that equals 1 if a bank’s annual corporate loan market share is above the 70th percentile (Q70) in that year, and 0 otherwise. | Refinitiv LoanConnector Dealscan |
| High Mkt Share (above Q80) | An indicator that equals 1 if a bank’s annual corporate loan market share is above the 80th percentile (Q80) in that year, and 0 otherwise. | Refinitiv LoanConnector Dealscan |
| High Mkt Share (above Q90) | An indicator that equals 1 if a bank’s annual corporate loan market share is above the 90th percentile (Q90) in that year, and 0 otherwise. | Refinitiv LoanConnector Dealscan |

**Figure 1. Parallel Trends Assumption**

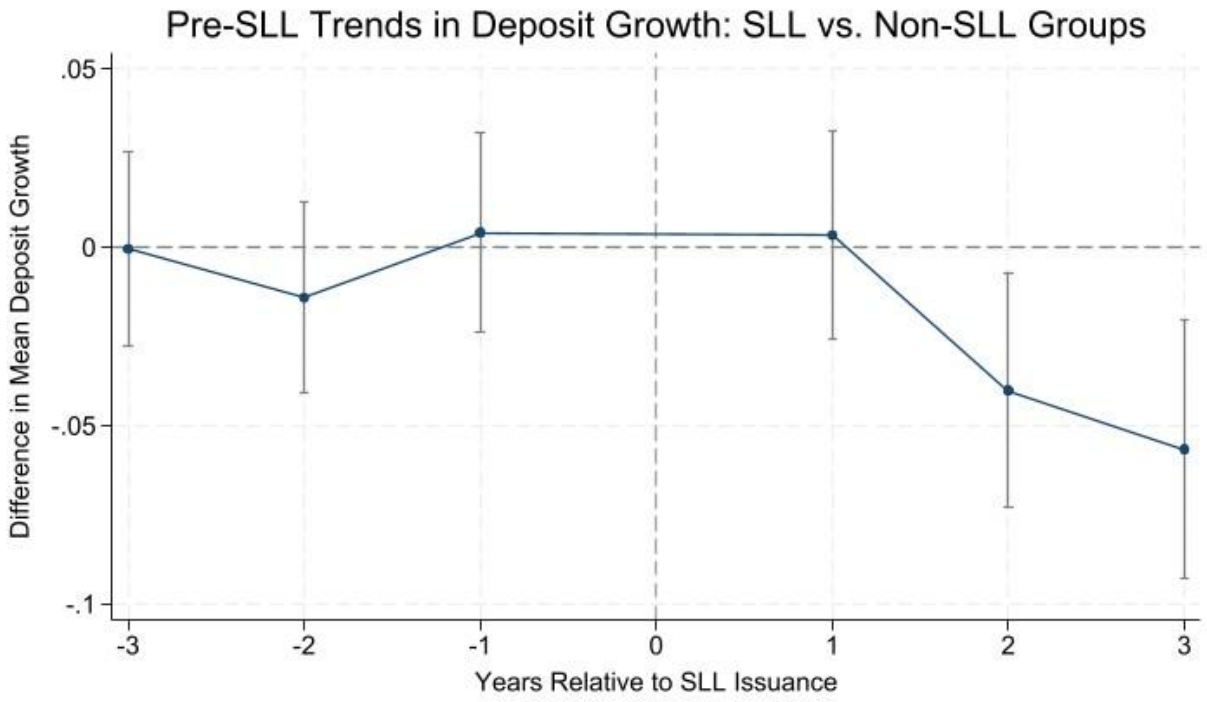


Figure 1 demonstrates the differences in average deposit growth (TDOMD: total domestic deposits) between sustainability-linked loan (SLL) lenders and their non-SLL counterparts. The y-axis represents the differences in deposit growth, and the x-axis shows time in years, with '0' marking the year of SLL issuance.

## Table 1. Descriptive Statistics

Table 1 presents the descriptive statistics of sustainability-linked loans (SLLs) between January 2016 and December 2024. Panel A reports the total SLL issuance size by year and the average fraction of SLLs in a lender's loan portfolio. Panel B reports the summary statistics of SLL lending relationships

Panel A: SLL by year

| Year | SLLs ($ million) | All Loans ($ million) | Ratio to All Loans (%) | Avg % of Lender's Portfolio |
|---|---|---|---|---|
| 2016 | 6212.5 | 5445530.71 | 0.11 | 0.34 |
| 2017 | 12006.05 | 6304987.45 | 0.19 | 0.23 |
| 2018 | 72043.31 | 6987901.73 | 1.03 | 1.59 |
| 2019 | 192902.3 | 6290156.59 | 3.07 | 2.99 |
| 2020 | 260795.87 | 5970500.25 | 4.37 | 5.74 |
| 2021 | 776885.58 | 7967362.32 | 9.75 | 11.53 |
| 2022 | 292149.29 | 6919713.27 | 4.22 | 7.10 |
| 2023 | 276816.65 | 6533491.71 | 4.24 | 8.87 |
| 2024 | 337361.38 | 8968810.31 | 3.76 | 6.40 |

Panel B: SLL lending relationship

| Variable | Mean | SD | Q1 | Median | Q3 |
|---|---|---|---|---|---|
| Relationship Number | 4.09 | 5.85 | 1 | 2 | 4 |
| Relationship Length (years) | 8.96 | 7.16 | 3.33 | 6.67 | 13.75 |
| Cumulative Loan Amount ($ million) | 6000.77 | 14991 | 554 | 1532.38 | 4778.84 |

**Table 2. Borrower Risk: Probability of Default**

Table 2 analyzes the relationship between borrower default risk and the likelihood of issuing a sustainability-linked loan (SLL). The dependent variable is an indicator equal to one for SLL loans and zero for matched non-SLL loans. The key independent variable is the borrower's probability of default (PD), measured three months prior to loan origination and constructed using forward-looking horizons ranging from 3 to 60 months. Panel A reports results based on the main matched sample, where non-SLL borrowers are firms in the same country, industry, and loan origination year that issued a loan in that year but have not issued an SLL. Panel B presents results based on an alternative sample that removes any borrower that has ever used an SLL during the sample period from the non-SLL group in the Main Sample. The regressions include country, industry, and year fixed effects, as well as country-year and industry-year interactions. Standard errors are clustered by borrower and year, and t-statistics are reported in parentheses. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL |
| PD_3M | -3.899** | -4.638*** | | | | | | | | | | |
| | (-2.045) | (-2.998) | | | | | | | | | | |
| PD_6M | | | -1.773** | -2.113*** | | | | | | | | |
| | | | (-2.124) | (-3.155) | | | | | | | | |
| PD_12M | | | | | -0.922** | -1.078*** | | | | | | |
| | | | | | (-2.338) | (-3.458) | | | | | | |
| PD_24M | | | | | | | -0.600*** | -0.677*** | | | | |
| | | | | | | | (-2.662) | (-3.759) | | | | |
| PD_36M | | | | | | | | | -0.507*** | -0.559*** | | |
| | | | | | | | | | (-2.848) | (-3.860) | | |
| PD_60M | | | | | | | | | | | -0.424*** | -0.459*** |
| | | | | | | | | | | | (-2.960) | (-3.804) |
| Borrower Country FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 3,469 | 3,453 | 3,469 | 3,453 | 3,469 | 3,453 | 3,469 | 3,453 | 3,469 | 3,453 | 3,469 | 3,453 |
| R-squared | 0.243 | 0.363 | 0.243 | 0.363 | 0.243 | 0.363 | 0.243 | 0.363 | 0.244 | 0.363 | 0.244 | 0.363 |

Panel B: Alternative Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL |
| PD_3M | -3.916** | -4.823*** | | | | | | | | | | |
| | (-2.014) | (-2.906) | | | | | | | | | | |
| PD_6M | | | -1.766** | -2.196*** | | | | | | | | |
| | | | (-2.083) | (-3.068) | | | | | | | | |
| PD_12M | | | | | -0.907** | -1.121*** | | | | | | |
| | | | | | (-2.277) | (-3.389) | | | | | | |
| PD_24M | | | | | | | -0.583** | -0.703*** | | | | |
| | | | | | | | (-2.569) | (-3.726) | | | | |
| PD_36M | | | | | | | | | -0.490*** | -0.580*** | | |
| | | | | | | | | | (-2.741) | (-3.849) | | |
| PD_60M | | | | | | | | | | | -0.410*** | -0.476*** |
| | | | | | | | | | | | (-2.856) | (-3.818) |
| Borrower Country FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 3,199 | 3,185 | 3,199 | 3,185 | 3,199 | 3,185 | 3,199 | 3,185 | 3,199 | 3,185 | 3,199 | 3,185 |
| R-squared | 0.247 | 0.348 | 0.247 | 0.348 | 0.247 | 0.348 | 0.247 | 0.349 | 0.247 | 0.349 | 0.248 | 0.349 |

**Table 3. Borrower Risk: S&P Credit Rating & Distance-to-Default**

Table 3 examines the relationship between borrower risk and the likelihood of issuing a sustainability-linked loan (SLL). The dependent variable equals one for SLL loans and zero for matched non-SLL loans. The key explanatory variable in Columns 1–4 is the borrower's S&P credit rating, measured three months prior to loan origination and coded so that AAA = 23, AA+ = 22, and so on, with larger values indicating better credit quality. In Columns 5–8, the key explanatory variable is the borrower's distance-to-default, also measured three months before loan issuance. Columns 1–2 and 5–6 use the main matched sample, where non-SLL borrowers are firms in the same country, industry, and origination year that issued a loan in that year but have never issued an SLL in that year. Columns 3–4 and 7–8 use an alternative sample that removes any borrower that has ever used an SLL during the sample period from the non-SLL group in the Main Sample. The regressions include country, industry, and year fixed effects, as well as country-year and industry-year interactions. Standard errors are clustered by borrower and year, and t-statistics are reported in parentheses. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Sample | Main Sample | | Alternative Sample | | Main Sample | | Alternative Sample | |
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL |
| S&P Credit Rating | 0.008*** | 0.008*** | 0.008*** | 0.008*** | | | | |
| | (3.748) | (3.581) | (3.486) | (3.627) | | | | |
| Distance-to-Default | | | | | 0.005** | 0.004** | 0.005** | 0.005** |
| | | | | | (2.365) | (2.046) | (2.475) | (2.394) |
| Borrower Country FE | Y | N | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 1,867 | 1,852 | 1,707 | 1,697 | 3,469 | 3,452 | 3,200 | 3,185 |
| R-squared | 0.260 | 0.341 | 0.269 | 0.308 | 0.241 | 0.361 | 0.246 | 0.349 |

## Table 4. Borrower Risk: Credit Events

Table 4 examines subsequent borrower credit outcomes over the life of the loan. The main independent variable is an indicator for sustainability-linked loans (SLL), equal to one for SLL loans and zero for matched non-SLL loans. Columns 1–2 define Default as a downgrade of the borrower's S&P credit rating to either 'D' or 'SD' during the loan period. Columns 3–4 define Default narrowly as a downgrade to 'D', while Columns 5–6 define Default as a downgrade to 'SD'. Columns 7–8 use an indicator for any credit rating downgrade, and Columns 9–10 use an indicator for any credit rating upgrade over the loan's life. Panel A reports results based on the main matched sample, where non-SLL borrowers are firms in the same country, industry, and loan origination year that issued a loan in that year but have not issued an SLL. Panel B presents results from an alternative sample that removes any borrower that has ever used an SLL during the sample period from the non-SLL group in the Main Sample. The regressions include country, industry, and year fixed effects, as well as country-year and industry-year interactions. Standard errors are clustered by borrower and year, and t-statistics are reported in parentheses. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Dependent Variable | Default ('D' & 'SD') | Default ('D' & 'SD') | Default ('D') | Default ('D') | Default ('SD') | Default ('SD') | Downgrade | Downgrade | Upgrade | Upgrade |
| SLL | -0.034*** | -0.032** | -0.027** | -0.026** | -0.012** | -0.008 | -0.065 | -0.069 | 0.017 | 0.030 |
| | (-2.886) | (-2.395) | (-2.428) | (-2.087) | (-2.031) | (-1.635) | (-0.967) | (-0.942) | (0.268) | (0.446) |
| Borrower Country FE | Y | N | Y | N | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 2,076 | 2,059 | 2,076 | 2,059 | 2,076 | 2,059 | 2,076 | 2,059 | 2,076 | 2,059 |
| R-squared | 0.080 | 0.115 | 0.076 | 0.109 | 0.109 | 0.131 | 0.098 | 0.149 | 0.110 | 0.149 |

Panel B: Alternative Sample

| Dependent Variable | (1) Default ('D' & 'SD') | (2) Default ('D' & 'SD') | (3) Default ('D') | (4) Default ('D') | (5) Default ('SD') | (6) Default ('SD') | (7) Downgrade | (8) Downgrade | (9) Upgrade | (10) Upgrade |
|---|---|---|---|---|---|---|---|---|---|---|
| SLL | -0.038*** | -0.034** | -0.030** | -0.028** | -0.013** | -0.009 | -0.063 | -0.089 | 0.006 | 0.010 |
| | (-2.852) | (-2.430) | (-2.411) | (-2.127) | (-1.977) | (-1.596) | (-0.864) | (-1.174) | (0.092) | (0.146) |
| Borrower Country FE | Y | N | Y | N | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 1,899 | 1,888 | 1,899 | 1,888 | 1,899 | 1,888 | 1,899 | 1,888 | 1,899 | 1,888 |
| R-squared | 0.085 | 0.121 | 0.084 | 0.117 | 0.109 | 0.132 | 0.087 | 0.125 | 0.106 | 0.139 |

**Table 5. Drivers of Post-Issuance Credit Events: Selection Effect vs. SLL Effect**

Table 5 analyzes the determinants of subsequent borrower credit events over the life of the loan. The main independent variable is an indicator equal to one for sustainability-linked loans (SLLs) and zero for matched non-SLL loans. Borrower credit risk at origination is controlled for using the S&P credit rating measured three months prior to loan issuance. Credit event outcomes are defined as follows: Columns 1–2 use a Default indicator equal to one if the borrower's S&P rating is downgraded to either 'D' or 'SD' during the loan period. Columns 3–4 define Default strictly as a downgrade to 'D,' while Columns 5–6 define Default as a downgrade to 'SD.' Panel A reports results based on the main matched sample, where non-SLL borrowers are firms in the same country, industry, and loan origination year that issued a loan in that year but have not issued an SLL. Panel B presents results from an alternative sample that removes any borrower that has ever used an SLL during the sample period from the non-SLL group in the Main Sample. The regressions include country, industry, and year fixed effects, as well as country-year and industry-year interactions. Standard errors are clustered by borrower and year, and t-statistics are reported in parentheses. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent Variable | Default ('D' & 'SD') | Default ('D' & 'SD') | Default ('D') | Default ('D') | Default ('SD') | Default ('SD') |
| SLL | -0.014 | -0.001 | -0.009 | 0.001 | -0.009 | -0.004 |
| | (-1.109) | (-0.082) | (-0.809) | (0.152) | (-1.256) | (-0.592) |
| S&P Credit Rating | -0.018*** | -0.018*** | -0.015*** | -0.014*** | -0.005** | -0.005** |
| | (-4.818) | (-4.744) | (-4.414) | (-4.336) | (-2.039) | (-2.075) |
| Borrower Country FE | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 1,867 | 1,852 | 1,867 | 1,852 | 1,867 | 1,852 |
| R-squared | 0.180 | 0.215 | 0.160 | 0.192 | 0.138 | 0.163 |

Panel B: Alternative Sample

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent Variable | Default ('D' & 'SD') | Default ('D' & 'SD') | Default ('D') | Default ('D') | Default ('SD') | Default ('SD') |
| SLL | -0.015 | -0.002 | -0.010 | 0.000 | -0.009 | -0.004 |
| | (-1.110) | (-0.142) | (-0.825) | (0.046) | (-1.209) | (-0.507) |
| S&P Credit Rating | -0.019*** | -0.019*** | -0.015*** | -0.015*** | -0.005** | -0.006** |
| | (-4.837) | (-4.743) | (-4.426) | (-4.321) | (-2.039) | (-2.105) |
| Borrower Country FE | Y | N | Y | N | Y | N |
| Industry FE | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N |
| Borrower Country * Year FE | N | Y | N | Y | N | Y |
| Industry * Year FE | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 1,707 | 1,697 | 1,707 | 1,697 | 1,707 | 1,697 |
| R-squared | 0.186 | 0.221 | 0.168 | 0.199 | 0.138 | 0.164 |

## Table 6. Bank Performance Around the Issuance of SLLs: Baseline Results

Table 6 examines how bank deposits change around the issuance of sustainability-linked loans (SLLs). The variable Post equals one for observations within three years after SLL issuance and zero for observations within three years before issuance. The variable SLL equals one for SLL-issuing banks and zero for matched banks that issue only non-SLL loans in a given year. Columns 1–2 use TDOMD, total domestic deposits; Columns 3–4 use DPDC, customer demand deposits; and Columns 5–6 use DPSC, customer savings deposits. Panel A reports results using the main matched sample, in which non-SLL lenders are banks in the same country and origination year that issued a loan in that year but have never issued an SLL. Panel B reports results using an alternative sample that removes from the non-SLL group all lenders that have ever issued an SLL during the sample period. All specifications include lender fixed effects, as well as lender-country and year fixed effects. Standard errors are clustered at both the lender and year levels, and t-statistics are reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent Variable | Growth_TDOMD | Growth_TDOMD | Growth_DPDC | Growth_DPDC | Growth_DPSC | Growth_DPSC |
| SLL * Post | -0.019** | -0.020** | -0.085*** | -0.085*** | -0.053*** | -0.054*** |
| | (-2.305) | (-2.455) | (-4.860) | (-4.798) | (-3.729) | (-3.708) |
| SLL | -0.005 | 0.005 | 0.009 | 0.032*** | -0.006 | 0.021 |
| | (-0.745) | (0.793) | (0.678) | (2.605) | (-0.498) | (1.537) |
| Lender Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| Lender FE | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 1,245 | 1,245 | 1,391 | 1,391 | 1,118 | 1,118 |
| R-squared | 0.066 | 0.115 | 0.088 | 0.134 | 0.045 | 0.093 |

Panel B: Alternative Sample

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent Variable | Growth_TDOMD | Growth_TDOMD | Growth_DPDC | Growth_DPDC | Growth_DPSC | Growth_DPSC |
| SLL * Post | -0.020** | -0.020** | -0.087*** | -0.086*** | -0.054*** | -0.055*** |
| | (-2.397) | (-2.398) | (-4.924) | (-4.809) | (-3.789) | (-3.774) |
| SLL | -0.013* | - | -0.014 | - | -0.016 | - |
| | (-1.682) | | (-0.917) | | (-1.281) | |
| Lender Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| Lender FE | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 885 | 885 | 1,006 | 1,006 | 801 | 801 |
| R-squared | 0.076 | 0.119 | 0.101 | 0.138 | 0.058 | 0.099 |

## Table 7. Bank Performance Around the Issuance of SLLs: Dynamic Specifications

Table 7 examines how banks' total deposits evolve over time around the issuance of sustainability-linked loans (SLLs). To capture the dynamics of the SLL market, we sequentially expand the sample by SLL cohort year. In Column 1, the sample includes banks that issued SLLs during 2016–2017 and their matched peers; thus, Column 1 reports results based on the 2016–2017 SLL cohorts. Similarly, in Column 2, the sample is expanded to include banks that issued SLLs during 2016–2018, along with their peers. This process continues sequentially across columns. The variable Post equals one for observations within three years after SLL issuance and zero for observations within three years before issuance. The variable SLL equals one for SLL-issuing banks and zero for matched banks that issue only non-SLL loans in a given year. Panel A reports results using the main matched sample, where non-SLL lenders are banks in the same country and origination year that issued a loan in that year but have never issued an SLL. Panel B reports results using an alternative sample that removes from the non-SLL group all lenders that have ever issued an SLL during the sample period. All specifications include lender fixed effects, as well as lender-country and year fixed effects. Standard errors are clustered at both the lender and year levels, and t-statistics appear in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Sample: SLL issuance cohort years ≤ *t* | *t* = Year 2017 | *t* = Year 2018 | *t* = Year 2019 | *t* = Year 2020 | *t* = Year 2021 | *t* = Year 2022 | *t* = Year 2023 | *t* = Year 2024 |
| Dependent Variable | Growth_TDOMD | Growth_TDOMD | Growth_TDOMD | Growth_TDOMD | Growth_TDOMD | Growth_TDOMD | Growth_TDOMD | Growth_TDOMD |
| SLL * Post | 0.059** | 0.046*** | 0.043*** | 0.026*** | -0.003 | -0.014 | -0.019** | -0.020** |
| | (2.315) | (2.674) | (3.800) | (2.957) | (-0.310) | (-1.527) | (-2.322) | (-2.455) |
| SLL | -0.024* | -0.017 | -0.020** | -0.011 | 0.004 | 0.002 | 0.004 | 0.005 |
| | (-1.809) | (-1.118) | (-2.107) | (-1.447) | (0.514) | (0.315) | (0.515) | (0.793) |
| Lender Country FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Lender FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 294 | 446 | 602 | 751 | 917 | 1,049 | 1,162 | 1,245 |
| R-squared | 0.167 | 0.132 | 0.117 | 0.123 | 0.105 | 0.108 | 0.111 | 0.115 |

Panel B: Alternative Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Sample: SLL issuance cohort years ≤ *t* | *t* = Year 2017 | *t* = Year 2018 | *t* = Year 2019 | *t* = Year 2020 | *t* = Year 2021 | *t* = Year 2022 | *t* = Year 2023 | *t* = Year 2024 |
| Dependent Variable | Growth TDOMD | Growth TDOMD | Growth TDOMD | Growth TDOMD | Growth TDOMD | Growth TDOMD | Growth TDOMD | Growth TDOMD |
| SLL * Post | 0.059** | 0.046** | 0.043*** | 0.026*** | -0.003 | -0.014 | -0.020** | -0.020** |
| | (2.226) | (2.600) | (3.632) | (2.856) | (-0.297) | (-1.496) | (-2.298) | (-2.398) |
| Lender Country FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Lender FE | Y | Y | Y | Y | Y | Y | Y | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 99 | 171 | 303 | 434 | 593 | 700 | 805 | 885 |
| R-squared | 0.203 | 0.167 | 0.133 | 0.135 | 0.106 | 0.111 | 0.113 | 0.119 |

## Table 8. What Drives the Issuance of SLLs? The Role of Bank Market Capitalization and Corporate Loan Market Share

Table 8 examines how bank size and lending market share relate to the likelihood of issuing sustainability-linked loans (SLLs). The dependent variable is an indicator equal to one for banks that issue at least one SLL in a given year and zero for matched banks that issue only non-SLL loans. The key explanatory variables are indicators for banks with relatively larger market capitalization or greater corporate lending market share. Panel A presents results based on the main matched sample, where non-SLL lenders are banks in the same country and loan origination year that issued a loan in that year but have not issued an SLL. Panel B reports results from an alternative sample that removes from the non-SLL group all lenders that have ever issued an SLL during the sample period. Model specifications include lender country and year fixed effects, as well as country-year interactions. Standard errors are clustered at the lender and year levels, and t-statistics are reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL |
| High Mkt Cap (Top 10) | 0.591*** | 0.592*** | | | | | | | | | | |
| | (13.422) | (13.524) | | | | | | | | | | |
| High Mkt Cap (Top 20) | | | 0.492*** | 0.493*** | | | | | | | | |
| | | | (12.989) | (13.264) | | | | | | | | |
| High Mkt Cap (Top 30) | | | | | 0.446*** | 0.442*** | | | | | | |
| | | | | | (13.556) | (13.155) | | | | | | |
| High Mkt Share (above Q90) | | | | | | | 0.486*** | 0.490*** | | | | |
| | | | | | | | (30.456) | (29.488) | | | | |
| High Mkt Share (above Q80) | | | | | | | | | 0.424*** | 0.430*** | | |
| | | | | | | | | | (27.206) | (26.746) | | |
| High Mkt Share (above Q70) | | | | | | | | | | | 0.374*** | 0.382*** |
| | | | | | | | | | | | (23.638) | (23.224) |
| Lender Country FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Lender Country * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 2,910 | 2,894 | 2,910 | 2,894 | 2,910 | 2,894 | 2,910 | 2,894 | 2,910 | 2,894 | 2,910 | 2,894 |
| R-squared | 0.227 | 0.277 | 0.237 | 0.287 | 0.245 | 0.295 | 0.394 | 0.444 | 0.358 | 0.409 | 0.311 | 0.362 |

Panel B: Alternative Sample

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL |
| High Mkt Cap (Top 10) | 0.643*** | 0.647*** | | | | | | | | | | |
| | (21.997) | (19.639) | | | | | | | | | | |
| High Mkt Cap (Top 20) | | | 0.560*** | 0.555*** | | | | | | | | |
| | | | (18.136) | (16.486) | | | | | | | | |
| High Mkt Cap (Top 30) | | | | | 0.524*** | 0.526*** | | | | | | |
| | | | | | (16.912) | (15.946) | | | | | | |
| High Mkt Share (above Q90) | | | | | | | 0.560*** | 0.569*** | | | | |
| | | | | | | | (31.385) | (30.233) | | | | |
| High Mkt Share (above Q80) | | | | | | | | | 0.573*** | 0.582*** | | |
| | | | | | | | | | (32.987) | (32.119) | | |
| High Mkt Share (above Q70) | | | | | | | | | | | 0.517*** | 0.527*** |
| | | | | | | | | | | | (28.186) | (27.500) |
| Lender Country FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Year FE | Y | N | Y | N | Y | N | Y | N | Y | N | Y | N |
| Lender Country * Year FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 2,153 | 2,123 | 2,153 | 2,123 | 2,153 | 2,123 | 2,153 | 2,123 | 2,153 | 2,123 | 2,153 | 2,123 |
| R-squared | 0.272 | 0.299 | 0.288 | 0.314 | 0.301 | 0.327 | 0.482 | 0.509 | 0.512 | 0.537 | 0.450 | 0.474 |

## Table 9. What Drives the Issuance of SLLs? The Role of Bank Executives' Compensation

Table 9 examines whether bank executives' compensation incentives are associated with the likelihood of issuing sustainability-linked loans (SLLs). The dependent variable equals one for SLLs and zero for non-SLLs. The key independent variable, Post_FirstESGPay, is an indicator set to one for loan contracts originated after the fiscal year-end when a bank first adopts ESG-linked performance metrics in executive compensation, and zero otherwise. For banks that never adopt such metrics, the variable remains zero throughout. Columns 1–3 report results based on the main matched sample, where non-SLL lenders are banks in the same country and origination year that issue a loan in that year but do not issue an SLL. Columns 4–6 use an alternative sample that removes from the non-SLL group all lenders that have ever issued an SLL during the sample period. Columns 1 and 4 include all ESG-related compensation metrics (CSR, environmental, and social). Columns 2 and 5 focus on environmental metrics only, and Columns 3 and 6 focus on social metrics only. All regressions include lender country and lender fixed effects. Standard errors are clustered at both the bank and year levels, with t-statistics reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| ESG Metric | ALL | ENV | SOC | ALL | ENV | SOC |
| Sample | | Main Sample | | | Alternative Sample | |
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL |
| Post_FirstESGPay | 0.348*** | 0.246** | 0.337*** | 0.170** | 0.268* | 0.173** |
| | (5.452) | (2.285) | (5.179) | (2.062) | (1.913) | (2.066) |
| Lender Country FE | Y | Y | Y | Y | Y | Y |
| Lender FE | Y | Y | Y | Y | Y | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 21,940 | 21,940 | 21,940 | 8,842 | 8,842 | 8,842 |
| R-squared | 0.602 | 0.555 | 0.596 | 0.902 | 0.903 | 0.902 |

## Table 10. What Drives the Issuance of SLLs? The Role of Lending Relationships

Table 10 examines the association between sustainability-linked loan (SLL) issuance and the strength of existing lending relationships. Relationship depth is measured along three dimensions: Relationship Number, defined as the cumulative number of loan contracts between a borrower and lender prior to the focal loan; Relationship Length, measured as the number of years since the first loan between the pair; and Ln(Cumulative Loan Amount), defined as the natural logarithm of the total amount the lender has extended to the borrower prior to the focal loan. The regressions include borrower–lender pair fixed effects, as well as borrower country, lender country, and industry fixed effects. Standard errors are clustered at both the borrower and lender levels, with t-statistics reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL | SLL |
| Relationship Number | 0.007*** | 0.007*** | 0.007*** | 0.007*** | | | | | | | | |
| | (14.701) | (14.545) | (14.535) | (14.397) | | | | | | | | |
| Relationship Length | | | | | 0.006*** | 0.006*** | 0.006*** | 0.006*** | | | | |
| | | | | | (16.662) | (16.806) | (16.446) | (16.614) | | | | |
| Ln(Cumulative Loan Amount) | | | | | | | | | 0.012*** | 0.012*** | 0.012*** | 0.012*** |
| | | | | | | | | | (10.217) | (10.218) | (9.922) | (9.944) |
| Borrower Country FE | N | N | Y | Y | N | N | Y | Y | N | N | Y | Y |
| Lender Country FE | N | N | Y | Y | N | N | Y | Y | N | N | Y | Y |
| Industry FE | N | Y | N | Y | N | Y | N | Y | N | Y | N | Y |
| Borrower–Lender Pair FE | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Clustering | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Observations | 88,494 | 88,491 | 88,494 | 88,491 | 88,494 | 88,491 | 88,494 | 88,491 | 88,494 | 88,491 | 88,494 | 88,491 |
| R-squared | 0.422 | 0.423 | 0.423 | 0.424 | 0.421 | 0.422 | 0.422 | 0.423 | 0.419 | 0.420 | 0.421 | 0.422 |

# Supplementary Appendix

## Table A.1. Bank Performance Around the Issuance of SLLs

Table A.1 examines how bank lending changes around the issuance of sustainability-linked loans (SLLs). The variable Post equals one for observations within three years after loan issuance and zero for observations within three years prior. The variable SLL equals one for banks that issue at least one SLL in a given year and zero for matched banks that issue only non-SLL loans. Columns 1–2 use LCACLD (commercial and industrial loans), and Columns 3–4 use LCACRD (consumer loans). Panel A reports results for the main matched sample, where non-SLL lenders are banks in the same country and origination year that issued a loan in that year but have not issued an SLL. Panel B presents results using an alternative sample that removes from the non-SLL group all lenders that have ever issued an SLL during the sample period. All specifications include lender fixed effects, as well as lender country and year fixed effects. Standard errors are clustered at the lender and year levels, with t-statistics reported in parentheses. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Main Sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable | Growth_LCACLD | Growth_LCACLD | Growth_LCACRD | Growth_LCACRD |
| SLL * Post | -0.007 | -0.003 | -0.007 | -0.008 |
| | (-0.529) | (-0.246) | (-0.454) | (-0.454) |
| SLL | -0.013 | -0.021 | -0.009 | 0.047*** |
| | (-0.886) | (-1.432) | (-0.596) | (2.908) |
| Lender Country FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Lender FE | N | Y | N | Y |
| Clustering | Y | Y | Y | Y |
| Observations | 1,331 | 1,331 | 1,367 | 1,367 |
| R-squared | 0.013 | 0.103 | 0.046 | 0.113 |

Panel B: Alternative Sample

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable | Growth_LCACLD | Growth_LCACLD | Growth_LCACRD | Growth_LCACRD |
| SLL * Post | -0.005 | -0.001 | -0.009 | -0.009 |
| | (-0.401) | (-0.073) | (-0.552) | (-0.557) |
| SLL | -0.039*** | - | -0.027 | - |
| | (-2.889) | | (-1.518) | |
| Lender Country FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Lender FE | N | Y | N | Y |
| Clustering | Y | Y | Y | Y |
| Observations | 946 | 946 | 1,023 | 1,023 |
| R-squared | 0.025 | 0.112 | 0.061 | 0.131 |

## Table A.2. Bank Performance Around the Issuance of SLLs: Subsample Analysis

Table A.2 examines how bank deposits change around the issuance of sustainability-linked loans (SLLs). The variable Post equals one for observations within three years after SLL issuance and zero for observations within three years before issuance. The variable SLL equals one for SLL-issuing banks and zero for matched banks that issue only non-SLL loans in a given year. Columns 1–2 use TDOMD, total domestic deposits; Columns 3–4 use DPDC, customer demand deposits; and Columns 5–6 use DPSC, customer savings deposits. The analysis is based on the main matched sample, where non-SLL lenders are defined as banks in the same country and origination year that issued a loan but never issued an SLL. Panel A presents results for SLL cohorts issued during 2016–2020, while Panel B covers cohorts from 2021–2024. All specifications include lender fixed effects, as well as lender-country and year fixed effects. Standard errors are clustered at both the lender and year levels, and t-statistics are reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: SLL cohorts issued during 2016–2020

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent Variable | Growth_TDOMD | Growth_TDOMD | Growth_DPDC | Growth_DPDC | Growth_DPSC | Growth_DPSC |
| SLL * Post | 0.027*** | 0.026*** | 0.057*** | 0.059*** | -0.011 | -0.010 |
| | (3.110) | (2.957) | (3.495) | (3.543) | (-0.539) | (-0.472) |
| SLL | -0.022** | -0.011 | -0.064*** | -0.035** | -0.021 | -0.004 |
| | (-2.343) | (-1.447) | (-3.933) | (-2.410) | (-1.124) | (-0.216) |
| Lender Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| Lender FE | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 751 | 751 | 835 | 835 | 679 | 679 |
| R-squared | 0.064 | 0.123 | 0.093 | 0.152 | 0.027 | 0.077 |

Panel B: SLL cohorts issued during 2021–2024

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Dependent Variable | Growth_TDOMD | Growth_TDOMD | Growth_DPDC | Growth_DPDC | Growth_DPSC | Growth_DPSC |
| SLL * Post | -0.070*** | -0.071*** | -0.232*** | -0.236*** | -0.097*** | -0.100*** |
| | (-6.951) | (-6.898) | (-17.749) | (-17.675) | (-5.769) | (-5.572) |
| SLL | 0.003 | 0.012 | 0.058*** | 0.081*** | -0.001 | 0.041** |
| | (0.327) | (0.983) | (3.490) | (5.051) | (-0.049) | (2.345) |
| Lender Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| Lender FE | N | Y | N | Y | N | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 494 | 493 | 556 | 556 | 439 | 439 |
| R-squared | 0.122 | 0.176 | 0.170 | 0.209 | 0.103 | 0.157 |

## Table A.3. What Drives the Issuance of SLLs? The Role of Bank Executives' Compensation

Table A.3 examines whether bank executives' compensation incentives are associated with the likelihood of issuing sustainability-linked loans (SLLs). The dependent variable equals one for banks that issue at least one SLL in a given year and zero otherwise. The key explanatory variable, ESGPay, is an indicator equal to one in fiscal years when ESG-related performance metrics are incorporated into executive compensation, and zero otherwise. Banks that never introduce ESG-linked pay are coded as zero for all observations. Columns 1–3 report results based on the main matched sample, where non-SLL lenders are banks in the same country and origination year that issue a loan in that year but do not issue an SLL. Columns 4–6 use an alternative sample that excludes any lender that has ever issued an SLL during the sample period. Columns 1 and 4 include all ESG-related compensation metrics (CSR, environmental, and social). Columns 2 and 5 focus on environmental metrics only, and Columns 3 and 6 focus on social metrics only. All regressions include lender country, lender, and year fixed effects. Standard errors are clustered at both the bank and year levels, with t-statistics reported in parentheses. Statistical significance is denoted by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| ESG Metric | ALL | ENV | SOC | ALL | ENV | SOC |
| Sample | | Main Sample | | | Alternative Sample | |
| Dependent Variable | SLL | SLL | SLL | SLL | SLL | SLL |
| ESGPay | 0.132*** | -0.013 | 0.089** | 0.140** | 0.114 | 0.036 |
| | (3.156) | (-0.194) | (2.182) | (2.393) | (1.189) | (0.632) |
| Lender Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| Lender FE | Y | Y | Y | Y | Y | Y |
| Clustering | Y | Y | Y | Y | Y | Y |
| Observations | 21,940 | 21,940 | 21,940 | 8,842 | 8,842 | 8,842 |
| R-squared | 0.769 | 0.761 | 0.765 | 0.922 | 0.919 | 0.916 |

## About ECGI

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