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NOTES

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The Pricing of EU Taxonomy (Partially) Aligned Loans: Evidence from a Central Banking Disclosure Mandate*

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Abstract

This paper investigates whether EU Taxonomy reporting is associated with more favourable lending terms. Exploiting a Romanian supervisory requirement, introduced in April 2022 by the National Bank of Romania, that records each corporate loan's taxonomy status in the Central Credit Register, we compare taxonomy-related loans with matched non-eligible loans. Taxonomy-related loans receive longer maturities, lower borrowing costs, and larger exposures, especially when granted by banks that issue green or sustainability bonds, mainly for MREL requirements. The effect is observed mainly for EU Taxonomy partially aligned – rather than fully aligned-loans and is stronger for borrowers receiving a state guarantee loan. These findings suggest that taxonomy reporting already matters for bank credit allocation, while the distinction between partial and full alignment has not yet translated into a clear hierarchy of lending terms.

Keywords: EU Taxonomy, micro data, financial stability, corporate lending

JEL classification: E51, E58, H81

1. Introduction

The transition towards a low-carbon economy requires substantial investment and the mobilisation of both public and private capital. In the European Union, the sustainable finance agenda has been designed to facilitate this transition by improving the transparency of environmental risks and directing financial flows towards sustainable activities. A central element of this sustainable finance framework is the EU Taxonomy Regulation[1], which establishes a classification system for environmentally sustainable economic activities (European Commission, 2020).

This innovative tool and data dictionary aims to address the issue generated by the lack of a consistent definition of a 'green' economic activity and facilitates the access to reliable and comparable sustainability metrics for market participants. An emerging body of research has examined the effects of the EU Taxonomy across several dimensions. The literature has established that green finance taxonomies matter as reporting and classification infrastructures, with the strongest evidence clustering around disclosure effects, data and measurement challenges, investor responses, bank reporting practices, and the early signs of real financing effects (Brabec & Macháč, 2025; Chrzan & Pott, 2024a; Hummel & Bauernhofer, 2024). At the same time, the direct study of how taxonomy metrics reshape credit allocation remains comparatively limited and dispersed (Kirschenmann, 2022; Sautner *et al.*, 2026). Our study addresses this gap by exploiting the unique institutional setting of the Romanian Central Credit Register, which covers the reporting taxonomy alignment of loans and their climate destination.

In practice, the implementation of sustainability reporting requirements has been contested, key arguments from industry participants being regulatory complexity and compliance costs (Rasche *et al.*, 2026; Kirschenmann, 2022). In response, since 2025 the EU has introduced a series of simplification measures commonly referred to as the 'Omnibus' reform, aimed at reducing reporting complexity, streamlining the interaction between different sustainable finance regulations, and recalibrating their scope of application to companies and financial institutions. This evolving regulatory framework reinforces the importance of understanding whether taxonomy-related information is relevant in the process of granting bank loans. Our study also contributes by showing for the first time how the partial and full alignment of loans to the EU Taxonomy is priced, and whether *do no harm considerations* are useable for lenders. For this purpose, we leverage the new dataset from the Romanian Central Credit Register (CCR) available from mid-2022 and comprising the loans for financing climate-related activities and their level of alignment with the EU Taxonomy.

First, we evaluate whether banks in Romania apply different contractual terms at the origination of the loans for financing climate-related activities, or whether they distinguish between their level of alignment with the EU Taxonomy. This first

[1] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation (EU) 2019/2088. See: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32020R0852

assessment is conducted at micro (loan) level. We deepen our approach to see if banks that have issued green bonds or sustainable bonds, as part of their Minimum Requirement for Own Funds and Eligible Liabilities (MREL) requirements, tend to lend more to green activities, or apply better contractual terms such as a higher loan size and lower interest rate/s. Second, we add another layer to our approach and evaluate whether introducing disclosure requirements for banks changes their lending behaviour, leading to a green borrower-bank relationship (mezzo level). This assessment is conducted using a difference in difference approach at borrower level. We find that especially the banks that issue green or sustainable bonds for resolution purposes reward firms who access EU Taxonomy partially aligned loans in the form of lower cost of debt or higher volume of exposure. In addition, government guarantees contribute to lower margins on loans.

Our paper is structured as follows. In section 2 we explore various streams of literature on how the credit market can be influenced by sustainable finance regulations, the use of EU Taxonomy and the relation between green bond issuance and lending practices. Section 3 provides an overview of the data, main variables and the methodology applied. Section 4 presents the results and discusses the implications of our findings for policymakers and other stakeholders.

2. Literature review and contribution

2.1. GREEN FINANCE TAXONOMIES IN ACCOUNTING AND FINANCE LITERATURE

The rise of green finance policies has drawn substantial attention recently (Cojoianu *et al.*, 2025). The one key focus is on the EU Taxonomy, with most studies asking whether standardised taxonomy metrics improve disclosure quality, investor judgment, market transparency, and the steering of capital towards greener activities (Chrzan & Pott, 2024a, 2024b; Garcia-Torea *et al.*, 2024; Hummel & Bauernhofer, 2024; Nipper *et al.*, 2025; Schütze & Stede, 2021). A second stream studies measurement itself, especially the construction and interpretation of taxonomy revenue, CapEx, OpEx, and bank Green Asset Ratio metrics (Alessi *et al.*, 2024; Brühl, 2023; Hoepner & Schneider, 2022; Müller-Dethard & Petras, 2023; Petras *et al.*, 2026; Skoczylas *et al.*, 2024). A smaller third stream looks at financing outcomes such as loan pricing, debt costs, investment, and credit rationing (Boccaletti *et al.*, 2026; Lucarelli *et al.*, 2023; Pietrovito & Rancan, 2024; Rizzato *et al.*, 2026; Sautner *et al.*, 2026; Bassen *et al.*, 2025).

The accounting literature shows that the EU Taxonomy is not just another ESG label. It creates mandatory, financially anchored key performance indicators tied to

revenue, CapEx, and OpEx, which makes environmental disclosure more standardised and more auditable than much prior sustainability reporting (Alessi *et al.*, 2024; Hummel & Bauernhofer, 2024; Nipper *et al.*, 2025; Perina & Stacchezzini, 2024). At the same time, the reporting literature documents some challenges related to first time implementation. Firms' reporting quality depends heavily on data architecture, interpretation of technical criteria, and the availability of internal expertise (Garcia-Torea *et al.*, 2024; Hummel & Bauernhofer, 2024; O'Reilly *et al.*, 2023; Skoczylas *et al.*, 2024). This means that the accounting contribution of the taxonomy improves standardisation, but in its early implementation phase it is also characterised by some discretion through metric construction, boundary setting, and interpretation of criteria (Alessi *et al.*, 2024; Garcia-Torea *et al.*, 2024; Skoczylas *et al.*, 2024).

The more important gap for our study lies in the implication of taxonomies for credit markets. Direct evidence exists, but only in a limited set of settings. Sautner *et al.* (2026) show that firms with higher shares of taxonomy-eligible transitional revenue, reconstructed for the period 2005-2018, face lower syndicated loan spreads, with a one standard deviation increase associated with about 5 basis points lower spreads. The effect is stronger where climate risk and environmental policy are more stringent and where lenders have green preferences. Rizzato *et al.* (2026), using 306 listed non-financial firms in the Stoxx Europe 600, find that higher taxonomy-aligned turnover is associated with lower cost of debt and that alignment with mitigation is far ahead of other environmental goals. Boccaletti *et al.* (2026) show that EU taxonomy-based environmental sector classification carries debt pricing information beyond broad ESG signals. Pietrovito and Rancan (2024) link sustainable activities to firm-level credit constraints and allocation patterns, though without building a full taxonomy theory of lender response. Kirschenmann (2022) frames the expected lending channel conceptually, arguing that banks are central to taxonomy transmission because they finance firms and are themselves subject to taxonomy-based requirements. A broader strand of the credit-market literature shows that banks incorporate environmental risks and regulatory exposure into loan pricing even outside the EU Taxonomy framework. Delis et al. (2024) find that banks charge higher loan rates to fossil-fuel firms exposed to climate-policy risk, particularly after 2015 and for loans with longer maturities. Similarly, Fard et al. (2020) show that firms subject to more stringent environmental regulations face higher borrowing costs and adjustments in other contractual terms.

The literature provides early evidence that taxonomy-related measures can matter for debt pricing and lending decisions, but direct research on credit impacts is still sparse relative to the much larger body of work on disclosure, implementation, and investor signalling (Boccaletti *et al.*, 2026; Garcia-Torea *et al.*, 2024; Hummel & Bauernhofer, 2024; Kirschenmann, 2022; Rizzato *et al.*, 2026; Sautner *et al.*, 2026). Much of the evidence is still tied to listed firms, large borrowers, or disclosed outcomes, leaving a thinner literature on private firms, small firms, and bank internal screening behaviour (Kirschenmann, 2022; Kosztowniak, 2024; O'Reilly *et al.*, 2023).

Summary of Key Literature Streams

Table A. Preliminary evidence in green taxonomy research

Theme	Key research question	What is already known	Representative papers
Reporting effects	How firms respond to taxonomy disclosure mandates	Early reporting has often been compliance-driven, with weak systems, costly data collection, and large implementation frictions	Hummel & Bauernhofer (2024); O'Reilly *et al.* (2023); Perina & Stacchezzini (2024); Skoczylas *et al.* (2024)
Data and measurement	How alignment metrics are built and interpreted	Revenue, CapEx, OpEx, eligibility, and alignment are complementary metrics based on which analytics can be built. Data quality and vendor coverage remain uneven.	Alessi *et al.* (2024); Hoepner & Schneider (2022); Schütze & Sandbaek (2025)
Investor response	Whether standardised taxonomy data changes judgments	Standardised taxonomy metrics improve comparability and can shape investor judgments, especially for more sophisticated investors	Chrzan & Pott (2024a, 2024b); Nipper *et al.* (2025)
Bank reporting and intermediation	How banks use taxonomy metrics and disclosures	The Green Asset Ratio has become central, but comparability problems and reporting heterogeneity remain substantial	Brühl (2023); Garcia-Torea *et al.* (2024); Müller-Dethard & Petras (2023); Petras *et al.* (2026)
Real financing effects	Whether taxonomy exposure changes financing terms	Some evidence links taxonomy-related measures to lower loan spreads or debt costs, but the evidence base is still narrow	Boccaletti *et al.* (2026); Pietrovito & Rancan (2024); Rizzato *et al.* (2026); Sautner *et al.* (2026)

Table B. Credit impact papers: Design, findings, and scope limits

Paper	Credit outcome	Main finding	Scope limit
Sautner *et al.* (2026)	Syndicated loan spreads	Firms with larger shares of taxonomy-eligible transitional revenue face lower loan spreads	Focuses on syndicated lending and mainly on eligibility linked to transitional activities
Rizzato *et al.* (2026)	Cost of debt	Higher taxonomy-aligned turnover is associated with lower borrowing costs	Based on data for listed European non-financial firms and manual 2023 reporting information
Boccaletti *et al.* (2026)	Cost of debt	EU taxonomy-based environmental sector classification carries debt pricing information beyond broad ESG signals	Focuses on debt pricing rather than credit quantity
Pietrovito & Rancan (2024)	Credit rationing	Sustainable activities are linked to firm-level credit constraints and allocation patterns	Does not build a full taxonomy theory of lender response
Kirschenmann (2022)	Bank lending	Frames the expected lending channel and shows why bank-level transmission should matter	Primarily conceptual rather than broad causal evidence

Background of the regulatory reporting requirements

In June 2021, the Romanian National Committee of Macroprudential Oversight (NCMO) issued Recommendation No. R/6/2021 on supporting green finance, whereby the NBR was mandated to improve the data collection related to green lending by extending the existing Central Credit Register with data about the climate destination of the loans and their degree of alignment with the EU Taxonomy.

In 2022, Regulation No. 7 of 21 April 2022 on the organisation and functioning of the Central Credit Register operated by the National Bank of Romania[2] amended and replaced Regulation 2/2012 and introduced the obligation for reporting institutions to declare the green loans and their alignment with the EU Taxonomy. The requirement entered into force on 1 June 2022, and the first reporting period was May 2022.

Green loans are identified based on climate-related activities financed categorised in seven segments, listed in no specific order below:

- renewable energy and heating systems – including production, transmission, appliances and products;
- energy efficiency – such as in new and refurbished buildings, energy storage, district heating, smart grids, appliances and products;
- urban and non-urban efficient transportation – such as electric, hybrid, public, rail, non-motorised, multi-modal transportation, infrastructure for clean energy vehicles and reduction of harmful emissions;
- waste and water usage reduction – including waste water treatment, reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling and energy/emission-efficient waste to energy, value added products from waste and remanufacturing, and associated environmental monitoring;
- green buildings that meet regional, national or internationally recognised standards or certifications; financing energy efficiency technologies – producing components or infrastructure for renewable energy or energy efficiency and other low carbon technologies; research and development for low carbon technologies; financing for climate change adaptation – including information support systems, such as climate observation and early warning systems; – eco-efficient and/or circular economy adapted products, production technologies and processes – such as development and introduction of environmentally friendlier products, with an eco-label or environmental certification, resource-efficient packaging and distribution.

Table C. Taxonomy alignment categories for green loans
(The table describes how green loans' alignment with the EU Taxonomy is decided based on three criteria and the lack of data or internal methodologies)

	Contributes to one or more of the six environmental objectives	Does not significantly harm any of the environmental objectives (DNSH)	Comply with the minimum social and corporate governance safeguards (MSS)
Not aligned	×	×	×
Uncertain	×	×	×
Partially aligned	✓	×	×
Aligned	✓	✓	✓

Note: An "X" for any criterion may reflect either non-compliance or insufficient data and/or methodologies to assess it.

2 Further changes were implemented after 2022, which are reflected in the current form of the Regulation (No.4/2025) and can be found at the address https://www.bnr.ro/uploads/editor/950847203.pdf. Details about green loans are available in Annex F3A.

3. Data and methodology

3.1. DATA

We use loan level data reported to the Central Credit Register (CRC) at the National Bank of Romania (NBR). This database contains, since mid-2022, an identifier for loans granted for climate-related activities (mitigation or adaptation), hereinafter referred to as green loans. CRC generates granular classification of green loans according to their alignment with the EU Taxonomy, including an intermediary category of partial alignment, currently subject to policy debates. This information has been collected in the CRC since June 2022, when a new reporting requirement entered into force (see details above), and the first reported data was for May 2022. Note that the identifier of climate-related loans is defined in a similar manner as in Neagu *et al.*, 2024. The loan level data is combined with debtor level information collected from financial statements at the Romanian Ministry of Finance. We therefore combine granular loan level data with details about the sector in which the debtors do business (based on NACE rev. 2), and other characteristics such as firms' size, leverage, profitability or liquidity. An additional piece of information relates to the green bond issuance in the banking sector.

The period under review is from May 2020 to April 2025. During this period, 3,157 green loans were granted to 1,700 unique borrowers by 18 banks in Romania, while the sample of non-green loans includes more than 560,000 loans. We only consider new green loans reported since May 2022, by removing those reported as restructured loans granted before this cut-off date, totalling 2,497 loans over the entire period. We also remove some other loans for which we lack of data at debtor level. The steps for establishing our sample are detailed in Table 1.

Table 1. Number of green and non-green loans by origination year for the period May 2020 – April 2025

Origination year	Including restructured loans		Step 1. Removing restructured loans		Step 2. Removing debtors with no financial information	
	No. of green loans	No. of non-green loans	No. of green loans	No. of non-green loans	No. of green loans	No.of non- green loans
2020		74,385		71,765		64,387
2021		113,560		110,046		98,418
2022	947	106,704	789	101,519	741	88,253
2023	1,085	119,689	844	110,871	814	96,209
2024	898	116,902	655	108,624	617	96,027
2025	227	31,625	209	27,943	185	24,904
Total	**3,157**	**562,849**	**2,497**	**530,768**	**2,357**	**468,198**
			660 loans excluded		**140 loans excluded**	

Note: Only the banks that granted and reported green loans to the Credit Register are included in the analysis, 18 banks out of 35 banks which extended loans to the non-financial corporations. Additionally, only balance sheet loans were considered.

There is a high degree of concentration at bank level in terms of green loans granted, as more than half (56%) of green loans are granted by 3 banks. These three banks issued green or sustainable bonds in the period 2021-2025. Additionally, most of partially aligned green loans are originated by these banks (87%). It is worth noting that these banks did not extend aligned green loans. For further details about the distribution of loans by banks, see Appendix 1, Table 1.

Identification of green loans

How do we define green loans? For reporting purposes, the NBR defined this category as "loans granted for projects or investments with the purpose of mitigating the impact of climate change, or for adapting to climate change challenges". The reporting framework is based on a set of seven categories of activities for climate-related purposes: 1. investment in renewable energy, 2. energy efficiency, 3. transport efficiency, 3. green buildings, 4. waste and water usage reduction, 5. financing of energy-efficient technologies, 6. financing for climate change adaptation and 7. other climate related activities. More details on the potential activities under each category are given above.

Identifying green activities and offering green products can pose challenges for banks, due to data availability, lack of appropriate expertise, unfavorable or unstable national policies and difficulty in finding profitable projects[3]. This is backed by the low volume of investment of Romanian firms in climate adaptation, with more than half of them holding no such investments[4].

Still, the share of green loans in bank's corporate portfolios followed on an upward trend, reaching 5% in June 2025. In terms of financed activity, green lending is mostly tilted towards financing green buildings (around 40% of the outstanding amount), renewable energy projects (around 15%) and energy efficiency, while financing for climate change adaptation or for energy-efficient technologies remains marginal. Real estate, utilities and trade are the sectors benefitting from green lending in Romania. In terms of size, large corporates have a higher share of green loans compared to SME's, out of which the majority are Taxonomy aligned loans and partially aligned loans.

In Appendix 1, Table 2 we present the distribution of green loans by NACE rev. 2 industry. An important aspect to note is that the EU taxonomy is a classification for economic activities and that one company may be involved in one or more economic activities. Very often, classifications are sectoral and focus on the main activity of a company, whereas the Taxonomy covers a multitude of economic activities which can be undertaken within a company.

3 Findings from the NBR's *Second climate risk questionnaire, June 2023*, https://www.bnr.ro/uploads/editor/914168193.pdf (only in Romanian)

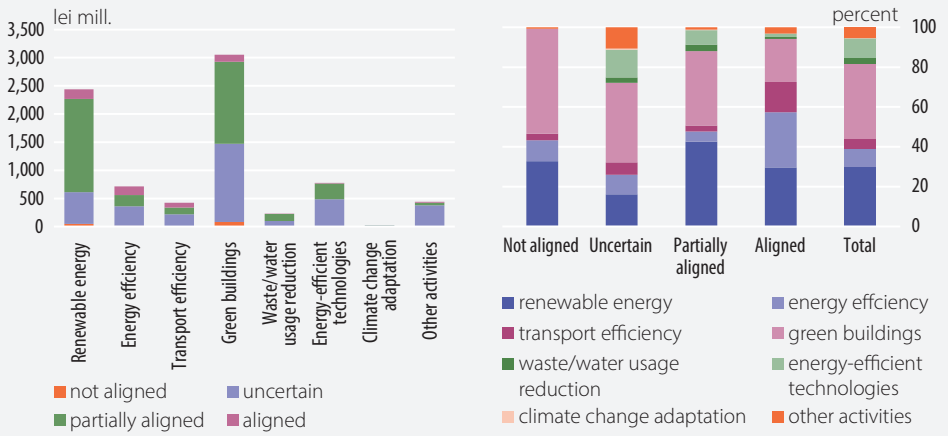
4 According to the NBR's *Survey on the access to finance of non-financial corporations in Romania, October 2022,* https://www.bnr.ro/uploads/publicatii/FCNEF%20October%202022.pdf

Taxonomy alignment

In order to establish the degree of alignment with the EU Taxonomy, green loans are evaluated against the following criteria: (i) the activity financed makes a substantial contribution to one or more of the six environmental objectives, in accordance with the Technical Screening Criteria (TSC), (ii) the activity financed does not significantly harm any of the environmental objectives (DNSH), and (iii) complies with the minimum social and corporate governance safeguards (MSS) set out in the EU Taxonomy.

A climate-related activity financed by banks can be either not aligned with the Taxonomy, partially aligned or aligned, or its alignment is uncertain (for further details, see Table C). Therefore, the degree of Taxonomy alignment is obtained directly from the reported data in the Central Credit Register.

Figure 1. The structure of green loans granted to non-financial corporations by EU Taxonomy alignment and activity financed based on the approved amount at origination.



Notes: The figures reflect the different levels of alignment with the EU Taxonomy of the green loan portfolio originated between May 2022 – April 2025. The data covers only the 18 financial institutions that reported information about green loans.

This is reflected in the structure of green loans analysed in this paper, where around 40% are flagged as uncertain, 50% as partially aligned and only 7% as totally aligned with the EU Taxonomy, with differences between the types of green loans (Figure 1). The green financing activity of the 18 banks in our sample indicates that alignment with EU Taxonomy is easily identified in case of energy efficiency projects, renewable energy projects and transport efficiency. The lack of data contributes to a high share of partially aligned financed activities for green buildings or renewable projects.

Table 2. Descriptive statistics
(This table sets out summary statistics for the main financial variables concerning debtors that took at least one green loan)

Variables	Obs.	Mean	Std. dev	Min	Max
ICR	2,357	6.81	6.14	0.00	18.97
Debt to assets (d2a)	2,357	0.68	0.39	0.00	4.4
ROA	2,357	0.32	0.39	-0.90	1.07
ROE	2,357	0.14	0.18	-0.62	0.90
General liquidity	2,357	2.18	3.59	0.00	33.08
Cash liquidity	2,357	1.44	3.04	0.00	30.28
Acid test ratio	2,357	0.55	1.53	0.00	18.59
Total assets (logarithm terms)	2,357	16.54	2.43	3.53	23.19
VA (logarithm terms)	2,357	15.51	2.27	6.59	21.95
Investment rate*	2,357	0.15	0.21	-1.34	0.96

*) a share of annualised cash flows related to investment activity to total assets

Firm-Level information is available on an annual basis from firms' financial statements reported at the Ministry of Finance. We use several categories of indicators, from indebtedness (e.g. debt-to-assets, interest coverage ratio or debt service coverage ratio), liquidity (general, liquidity, cash or acid test ratio), profitability measures (return on assets or return on equity, EBITDA), the economic sector of the firm (NACE rev. 2), size of the firm based on the EU definition[5] or by means of total assets. Table 2 shows the summary statistics for the main financial variables at firm level. Loan-Level Variables are extracted from the Central Credit Register database. We use various loan details, such as the amount approved or the amount drawn, the type of loan, year of origination, interest rate, currency and an identifier for the state guarantee. The loan spread is computed as the difference between the interest rate reported to the CCR and the interbank rate at the loan origination date, for local currency loans, euro, USD and Swiss franc denominated loans.

3.2. METHODOLOGY

Propensity score matching

Given the limited number of green loans we observe over the period under review (May 2022 – April 2025), we want to identify a matching set of loans not reported as green, granted to debtors similar to those receiving green loans. The aim is to assess the differences in contractual terms at origination between our treated group of green loans, irrespective of their alignment with the EU Taxonomy, and a matching sample of non-green loans.

5 European Commission, User guide to the SME Definition, 2020, https://ec.europa.eu/docsroom/documents/42921/attachments/1/translations/en/renditions/native

We use a propensity score combined with fixed matching. The matching method is the nearest neighborhood (with 1 and 2 matches) with a 0.1 caliper and without replacement. The propensity score is based mostly on firm level characteristics measured using the latest financial information available prior to loan origination[6] (Eq. 1) and is determined for each origination year (from 2022 to 2025). In the second step we impose several fixed criteria related to the firm: it should have the same size (SME or large company), and be in the same economic sector. Potential matches are drawn exclusively from the portfolio of new loans originated by the 18 banks which reported green lending to the CCR and each control is restricted to one treated loan.

$$Green\ loan_{\ i,t} = \beta_1 * Size_{j,t-1} + \beta_2 * CPRS_{\ j,t-1} + \beta_3 * Ln(Total\ assets)_{j,t-1} + \\ + \beta_4 * Debt\ bucket_{j,t-1} \qquad \text{(Eq. 1)}$$

where: *i* is the loan identification, *t* is time in annual terms (2022-2025) and *j* is the firm identifier. Size reflects the size of the debtors (SME or Corporate), CPRS is a dummy for climate policy relevant sectors[7], taking the value of 1 if the debtor is within this category and 0 otherwise. Debt bucket is a categorical variable with 5 buckets generated based on percentiles calculated for debt-to-assets for each year of loan origination, between 2022 and 2025.

This methodology identifies matching loans for 2066, and respectively 1995 green loans, if we restrict the search to one or two neighbours (Table 3). However, due to the limited number of green loans we use the entire sample together with the matching loans identified using the propensity score matching.

Table 3. Matching green loans
(The table sets out the number of matched loans under the two specifications, one (NN(1)) or two neighbours respectively (NN(2))

	NN (1)			NN (2)		
	Untreated	Treated	Total	Untreated	Treated	Total
0	2,066		2,066	3,983		3,983
1		2,066	2,066		1,995	1,995
Total	2,066	2,066	4,132	3,983	1,995	5,978

*) the matching method is the nearest neighbourhood with a 0.1 caliper and without replacement

Figure 1 in Appendix 2 shows the distribution of the main financial variables for the two categories, the treated and control sample, supporting the identification of the control sample.

6 Except for loans granted in the first months of 2025 for which 2024 data was not available. Financial statements from 2023 were used instead.

7 The complete list of CPRSs is available in the NBR's *Climate risk dashboard for the banking sector in Romania*, 2024 edition (https://www.bnr.ro/en/12232-climate-risk-dashboard-for-the-banking-sector-in-romania)

Do banks price differently green loans?

We investigate whether banks have a different lending strategy for green loans, offering better contractual terms or higher exposures compared to not reported as green loans (Eq. 2). The sample of loans include the green loans and the control sample identified with the PSM, as described before. We analyse loan spread, as well as the exposure amount (in logarithmic terms).

$$Lending\ terms_{i,t} = \alpha + \beta_1 * flag_{green} + \beta_2 * State\ guarantee + \\ + \beta_3 * GB\ issuing\ bank + \beta_4 * Loan\ characteristics_{i,t} + \\ + \beta_5 * Debtor\ characteriscts_{j,t-1} + \varepsilon_t \quad \text{(Eq. 2)}$$

where: *i* is the loan, *t* accounts for the year of origination and *j* for the debtor. Flag green is an identifier for the green loan, GB issuing bank is a dummy variable accounting for bank emitting sustainable or green bonds for resolution purposes; taking the value 1 starting with the trimester of the issuance, and 0 before the issuance[8] as well as for the banks that never issued such bonds; and state guarantee is a dummy variable which accounts for loans granted with a state guarantee when it takes the value of 1 (otherwise 0). We use fixed effects to control for banks' unobserved factors, type and currency of the loans and the economic sector of the debtor (NACE rev. 2, 2 digits). We use a fixed effects regression model, with robust standard errors.

Equation (2) presents the baseline specification, in which the explanatory variables are used separately. To explore potential heterogeneity, we estimate additional specifications with joint interaction terms, such as *State guarantee* and *GB issuing bank*, with the aim to examine whether green loans originated in the post issuance of the bond or the existence of a state guarantee are associated with different lending terms. However, since only one of the GB issuing banks completed its first issuance during the period under review, the available within-bank pre/post issuance variation is limited. Accordingly, the estimated heterogeneity is driven predominantly by within-bank differences between green and non-green loans, rather than by changes around the issuance date.

Out of the total green loans originated in the period May 2022-April 2025 and included in the analysis, we observe that 140 are granted with a state guarantee, and none of them entered into default in a one-year period after origination. However, the NPL ratio as of June 2025 for green loans with state guarantee is 0.9% (compared to 6.3% for the entire portfolio of state-backed loans).

Difference-in-difference analysis

We use the difference-in-difference with multiple time periods method by Callaway and Sant'Anna (2021) to explore how the newly-introduced reporting requirements for green loans and their alignment with the EU Taxonomy increased the awareness

[8] In our sample, for 2 out of the 3 GB issuing banks, the issuance was done prior the period analysed, therefore the variable is equal to 1 for the entire period.

of banks and influenced their behaviour towards green debtors. We define the firms that took at least one green loan since May 2022 as green debtors and as a control sample the debtors identified using the PSM.

In our specification, treatment year is considered the year when the debtor takes the first green loan: controls are either never treated or not treated yet. Data is consolidated at borrower-bank-year level or borrower-year level: exposures are summed, and lending standards are weighted (new lending covering 2020-2025 timeframe). Green debtor definition for these results are the following: a debtor that took a green loan at a specific bank; if it has other loans with other CI (not green), that debtor-bank relationship is not considered.

4. Results

The analysis at debtor level shows that most of the debtors with a green loan contracted other loans as well (71%) that were not evaluated as green by the reporting issuing bank (Appendix 1, Table 3). This contributes to the analysis of lending standards by providing a natural matching sample which comprises green and non-green loans contracted by the same debtor.

Table 4 shows descriptive statistics for green loans and non-green matched loans between 2022 and 2025. According to the definition constructed, a green loan is identified after May 2022. The first column represents the not-reported as green loans in the entire sample, the third, fourth and fifth columns represent the matched samples as described above, namely nearest neighbourhood, as well as the natural matching. The sixth column represents the green loans and the seven column represents the green loans granted by the banks that issued a green or sustainable bond at least once (irrespective of the year of issuance).

In terms of maturity, green loans have consistently higher maturities (4.1-5.4 years) compared to non-green loans (2.4-2.6 years), showing a longer term of orientation of the projects that enable green activities. The matching samples of non-green loans have similar maturities, except for the natural matching, which has considerably lower maturity.

Table 4. Contractual terms at origination for green vs. not reported as green loans

		Non-green loans (entire sample)	Non-green loans (without the natural matching sample)	Non-green, matched loans (NN(1))*	Non-green, matched loans (NN(2))**	Non-green loans to debtors with green loans (natural match)	Green loans	Green loans from GB issuing banks***	Total loans
2022	Original maturity	2.47	2.34	5.12	5.06	2.35	4.14	5.51	2.36
	Amount at origination	718,873	770,595	2,731,801	2,302,980	2,340,964	2,631,904	6,367,634	793,817
	Spread	3.27	3.6	2.93	3.12	2.53	2.64	2.77	3.56
2023	Original maturity	2.42	2.3	4.55	4.49	1.82	4.25	5.17	2.30
	Amount at origination	777,869	784,264	2,977,384	2,989,131	1,464,210	4,200,456	5,273,097	821,403
	Spread	3.80	3.8	3.16	3.06	2.98	3.07	2.44	3.80
2024	Original maturity	2.56	2.4	5.24	5.21	2.26	4.95	4.62	2.42
	Amount at origination	771,867	835,937	5,765,056	4,799,515	2,009,730	5,038,976	4,045,055	881,563
	Spread	3.62	3.7	2.60	2.80	2.53	2.96	2.70	3.66
2025	Original maturity	2.57	2.4	4.73	4.68	2.62	5.39	4.87	2.42
	Amount at origination	922,805	957,442	3,532,136	3,731,365	2,190,874	8,091,123	6,350,427	1,041,129
	Spread	3.85	4.01	2.76	3.00	2.45	2.65	2.69	3.96
Total	Original maturity	2.45	2.37	4.91	4.86	2.17	4.49	4.94	2.38
	Amount at origination	861,967	860,736	3,689,819	3,315,960	1,878,955	4,250,433	5,073,260	884,109
	Spread	3.78	3.9	2.91	3.01	2.68	2.87	2.64	3.93

*) near neighbourhood matching with one match, and respectively 2 matches (**); ***) green bond issuing banks that have issued at least one green or sustainable bond in the period under review.

Note: Based on the information from 18 banks, those that reported the origination of green loans after May 2022; the amount at origination is expressed in lei, the spread is expressed in percentage points and the original maturity in years.

Non-green loans carry notably higher spreads on average (3.3-3.9%) compared to green loans (2.6-3.1%). Given that the matched samples show similar spreads as the green loan sample (slightly higher in case of NN(1) and NN(2) but lower in case of the natural match), we cannot identify consistently a green loan spread across all years. On the other hand, this might also suggest the green project has better pricing that is not solely justified by the quality differences between borrowers. The amount at origination shows that green loans are substantially larger on average (lei 2.6-7.5 million) compared to non-green loans (lei 718K-907K). This can be explained by the nature of the financed projects. Green loans taken from green bond issuing banks have relatively narrower spreads and higher maturity, suggesting the strategy of the bank matters when designing the lending terms.

Step 2. Fixed effect regression for lending standards and exposure amount

Table 5.1. Loan amount at origination for green loans[9] compared to control loans and the natural matching sample^

		Matching sample NN(1)				Matching sample NN(2)				Natural matching sample^			
		Eq.1	Eq.2	Eq.3	Eq.4	Eq.1	Eq.2	Eq.3	Eq.4	Eq.1	Eq.2	Eq.3	Eq.4
	Green loan	-0.14*** (0.00)				-0.06 (0.14)				0.26*** (0.00)			
	GB issuing bank	0.41*** (0.00)		0.41*** (0.00)		0.33*** (0.00)		0.33*** (0.00)		0.16*** (0.01)		0.16*** (0.01)	
	State guarantee	0.50*** (0.00)	0.50*** (0.00)			0.51*** (0.00)	0.52*** (0.00)			0.76*** (0.00)	0.77*** (0.00)		
Compared to non-green loans granted from non-GB issuing banks	Non-green loan from GB issuing bank		0.55*** (0.00)				0.41*** (0.00)				0.10 (0.14)		
	Green loan from non-GB issuing bank		-0.06 (0.28)				0.00 (0.93)				0.19*** (0.00)		
	Green loan from GB issuing bank		0.25** (0.01)				0.22*** (0.01)				0.51*** (0.00)		
Compared to non-green loans without state guarantee	Non-green loan with state guarantee			0.47*** (0.00)				0.51*** (0.00)				0.85*** (0.00)	
	Green loan without state guarantee			-0.15*** (0.00)				-0.06 (0.16)				0.29*** (0.00)	
	Green loan with state guarantee			0.40*** (0.00)				0.46*** (0.00)				0.77*** (0.00)	
Compared to non-green loans, from non-GB issuing banks, without state guarantee	Non-green loan, non-GB issuing bank, with state guarantee				0.49*** (0.00)				0.54*** (0.00)				0.87*** (0.00)
	Non-green loan, GB issuing bank, without state guarantee				0.55*** (0.00)				0.42*** (0.00)				0.11 (0.11)
	Non-green loan, GB issuing bank, with state guarantee				1.01*** (0.00)				0.86*** (0.00)				0.90*** (0.00)
	Green loan, non-GB issuing bank, without state guarantee				-0.08 (0.19)				-0.01 (0.89)				0.21*** (0.00)
	Green loan, non-GB issuing bank, with state guarantee				0.63*** (0.00)				0.68*** (0.00)				0.85*** (0.00)
	Green loan, GB issuing bank, without state guarantee				0.27*** (0.01)				0.25*** (0.00)				0.55*** (0.00)
	Green loan, GB issuing bank, with state guarantee				0.16 (0.36)				0.11 (0.52)				0.55*** (0.00)
Firm level controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank, currency, loan type, economic sector and year FE[10]		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. obs.		4,423	4,423	4,423	4,423	6,340	6,340	6,340	6,340	8,382	8,382	8,382	8,382
Adj. Rsq		0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.39	0.39	0.39	0.39
Within Adj. Rsq		0.11	0.12	0.11	0.12	0.14	0.14	0.14	0.14	0.10	0.10	0.10	0.10
RMSE		1.31	1.31	1.31	1.31	1.32	1.32	1.32	1.32	1.34	1.34	1.34	1.34

Note: The FE regression is conducted for green loans and those matching loans obtained using the NN(1) and NN(2) matching, only for banks that reported green loans at Central Credit Register (CCR). GB issuing bank accounts for the three banks that issued sustainable or green bonds for resolution purposes. ^The natural matching sample includes debtors that took both green and non-green loans. The table shows the coefficients and p-values in parentheses: * p<0.10, ** p<0.05, *** p<0.0. The dependent variable is the logarithm of loan amount, and all explanatory variables are defined in Table 2. The lower part of the table sets out the type of fixed effects used in each specification.

[9] The estimations were conducted also for the sample of green loans for which we find a match, and the signs and magnitude of results remain similar.

[10] As a robustness, we also controlled for the month of loan origination, but the results remained relatively unchanged, pointing to the same conclusions.

The fixed-effect regression analysis shows evidence of differences in loan value between green and non-green loans which hold across the matching samples and bank characteristics. The state guarantees have a significant positive impact, as well as the issuance of green bonds by banks. All models have a reasonable fit with Adjusted R^2 between 0.39 and 0.45.

In case of the green loan premium (baseline effect), we observe that, in the natural matching sample, green loans have a significant positive coefficient (0.26) (in equation 1), which indicates that the same company will receive a higher loan amount when taking a green loan than when taking a non-green loan. This might suggest that when controlling more strictly for borrower characteristics, the estimation is isolating the green loan premium effect. The results for the matching sample 1 show an opposite sign of the coefficient (-0.14) for green loans, while the coefficient for matching sample 2 is not significant.

The role of banks issuing green or sustainable bonds seems to be consistent across all estimations. The coefficients for GB issuing bank are positive and significant for all matching samples (0.25, 0.22 and 0.51). The results are consistent with green-bond-issuing banks having a greater expertise in, or a stronger commitment to sustainable finance. The results indicate that green loans originated after the green/sustainable bond issuance are associated with higher amounts relative to matched non-green loans and, in the natural matching sample, among borrowers that contracted both green and non-green loans. Related evidence is provided by Fatica *et al.* (2021), who find that banks issuing green bonds reduce some of their lending exposure to carbon-intensive sectors, although they do not identify a significant green-bond pricing advantage for financial issuers. However, the results should be interpreted with care and not as evidence that green-bond issuance itself caused banks to increase green lending, since the timing may coincide with changes in funding capacity, portfolio composition, ESG strategy, or clientele. Nevertheless, GB issuing banks could play a crucial role in scaling up green finance.

State guarantees act as a powerful enabler for larger green loan amounts (strong positive effect on the loan size, with coefficients ranging from 0.50 to 0.77) and even higher for the matched non-green loans. State guarantee programs implemented in Romania between 2020 and 2024 where highly used and increased access to finance to a large number of firms. Even though the state guarantee programs were not specifically directed towards certain strategic objectives, such as environmental sustainability and resilience, the results show that they contributed to such strategic objectives, that most likely came from the demand side. However, most of the loans that received this state guarantee were short-term loans, intended to finance companies' current needs and not for investment purposes. A policy consideration can be to use this instrument to facilitate access to finance for projects that are contributing more targeted to strategic sectors and add more value in the economy and create better synergies[11]. This could also incentivise banks to develop green finance expertise in order to better channel the funds received from the state. There is also caution needed, research (Carletti; Leonello; Marquez, 2023) warns that the use of state guarantees could have a negative effect on banks' risk-taking, especially for poorly capitalised entities.

[11] The National Committee for Macroprudential Oversight, https://www.cnsmro.ro/res/ups/Raport_GL_CNSM.pdf, October 2025

The results lead us to discuss whether the "green loan size premium" is driven by a borrower selection rather that from the green label itself, as green projects might imply significant investment needs compared to other type of finance needs. A policy implication could be to provide support for smaller projects to access green lending, as well as to have standardized knowledge sharing platforms and standardised frameworks to evaluate green projects.

Table 5.2. Spread at origination for green loans[12] compared to matched loans and the natural matching sample^

		Matching sample NN(1)				Matching sample NN(2)				Natural matching sample^			
		Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 1	Eq. 2	Eq. 3	Eq. 4
	Green loan	-0.28* (0.05)				-0.31** (0.01)				-0.09 (0.43)			
	GB issuing bank	-0.33* (0.06)		-0.33* (0.06)		-0.07 (0.67)		-0.07 (0.66)		-0.26*** (0.01)		-0.26*** (0.01)	
	State guarantee	-1.64*** (0.00)	-1.64*** (0.00)			-1.76*** (0.00)	-1.75*** (0.00)			-1.19*** (0.00)	-1.19*** (0.00)		
Benchmark: non-green loan, from non-GB issuing banks	Non-green loan from GB issuing bank		-0.01 (0.98)				0.18 (0.43)				-0.17* (0.10)		
	Green loan from non-GB issuing bank		-0.09 (0.50)				-0.10 (0.37)				0.01 (0.95)		
	Green loan from GB issuing bank		-0.65*** (0.00)				-0.52*** (0.00)				-0.48*** (0.00)		
Benchmark: non-green loan, without state guarantee	Non-green loan with state guarantee			-1.74*** (0.00)				-1.84*** (0.00)				-1.12*** (0.00)	
	Green loan without state guarantee			-0.31* (0.06)				-0.34*** (0.01)				-0.07 (0.55)	
	Green loan with state guarantee			-1.77*** (0.00)				-1.81*** (0.00)				-1.49*** (0.00)	
Benchmark: non-green loans, from non-GB issuing banks, without state guarantee	Non-green loan, non-GB issuing bank, with state guarantee				-1.72*** (0.00)				-1.82*** (0.00)				-1.10*** (0.00)
	Non-green loan, GB issuing bank, without state guarantee				-0.02 (0.96)				0.18 (0.50)				-0.16 (0.12)
	Non-green loan, GB issuing bank, with state guarantee				-1.71*** (0.00)				-1.65*** (0.00)				-1.31*** (0.00)
	Green loan, non-GB issuing bank, without state guarantee				-0.10 (0.48)				-0.12 (0.35)				0.03 (0.82)
	Green loan, non-GB issuing bank, with state guarantee				-1.73*** (0.00)				-1.81*** (0.00)				-1.41*** (0.00)
	Green loan, GB issuing bank, without state guarantee				-0.69*** (0.00)				-0.57*** (0.00)				-0.46*** (0.00)
	Green loan, GB issuing bank, with state guarantee				-1.71*** (0.00)				-1.44*** (0.00)				-1.88*** (0.00)

[12] For robustness, the estimations were conducted also for the sample of green loans for which a match (or 2) is identified. The signs of the coefficients remain unchanged, however the effect stemming from the GB issuing banks is stronger.

– continued –

	Matching sample NN(1)				Matching sample NN(2)				Natural matching sample^			
	Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 1	Eq. 2	Eq. 3	Eq. 4
Firm level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank, currency, loan type, economic sector and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. obs.	4,188	4,188	4,188	4,188	5,972	5,972	5,972	5,972	8,082	8,082	8,082	8,082
Adj. Rsq	0.09	0.09	0.09	0.09	0.05	0.05	0.05	0.05	0.22	0.22	0.22	0.22
Within Adj. Rsq	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.03
RMSE	3.70	3.70	3.70	3.70	4.20	4.20	4.20	4.20	2.17	2.17	2.17	2.17

Note: The FE regression is conducted for green loans and those matching loans obtained using the NN(1) and NN(2) matching, only for banks that reported green loans at Central Credit Register (CCR). GB issuing bank (GB) accounts for the three banks that issued green or sustainable bonds for MREL purposes. ^The natural matching sample includes debtors that took both green and non-green loans. The table shows the coefficients and p-values in parentheses: * p<0.10, ** p<0.05, *** p<0.0. The dependent variable is the spread at the origination of the loan, and all explanatory variables are defined in Table 2. The lower part of the table sets out the type of fixed effects used in each specification.

Table 5.3. explores the connection between the Taxonomy alignment of the green loans granted in the period under review and the loan terms, such as amount at origination and spread.

Table 5.3. Within green: Does Taxonomy alignment matter?

			Amount at origination				Spread at origination			
			Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 1	Eq. 2	Eq. 3	Eq. 4
Benchmark: Green loan with uncertain alignment	Partially aligned		0.25 (0.25)	0.19 (0.40)			-0.05 (0.92)	-0.24 (0.63)		
	Aligned		0.45 (0.12)	0.32 (0.28)			0.03 (0.88)	-0.32 (0.20)		
	GB issuing bank		0.83*** (0.00)	0.67*** (0.00)			-0.43*** (0.00)	-0.72*** (0.01)		
	State guarantee		0.52*** (0.00)	0.56*** (0.00)	0.54*** (0.00)	0.58*** (0.00)	-1.45*** (0.00)	-1.41*** (0.00)	-1.46*** (0.00)	-1.41*** (0.00)
Benchmark: Green loan with uncertain alignment from non-GB issuing banks	Non-GB issuing bank	Partially aligned			1.07*** (0.01)	0.98** (0.01)			-0.32 (0.58)	-0.60 (0.34)
		Aligned			0.57* (0.07)	0.44 (0.17)			0.03 (0.89)	-0.32 (0.20)
	GB issuing bank	Uncertain alignment			1.86*** (0.00)	1.66*** (0.00)			-0.72 (0.40)	-1.10 (0.25)
		Partially aligned			1.90*** (0.00)	1.66*** (0.00)			-0.75 (0.21)	-1.33* (0.09)
Constant			9.43*** (0.00)	9.54*** (0.00)	8.82*** (0.00)	8.95*** (0.00)	4.85*** (0.00)	5.26*** (0.00)	5.02*** (0.00)	5.49*** (0.00)
Firm level controls										
Bank, currency, loan type, economic sector FE			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE			No	Yes	No	Yes	No	Yes	No	Yes
No. obs.			2,346	2,346	2,346	2,346	2,278	2,278	2,278	2,278
Adj. Rsq			0.41	0.41	0.41	0.41	0.11	0.11	0.11	0.11
Within Adj.Rsq			0.08	0.06	0.08	0.06	0.03	0.03	0.03	0.03
RMSE			1.32	1.31	1.32	1.31	3.09	3.08	3.09	3.08

Note: Several filters are applied to ensure that only green loans are included, taxonomy not aligned loans are excluded, due to their small share (0.6% of green loans); only observations with a positive interest rate spread are included. Estimations are conducted using fixed effects regressions, where the dependent variables are amount at origination (natural logarithm of the loan amount) and spread at origination. Independent variables are green loans, taxonomy alignment, state guarantee, as well as firm size as a categorical variable and general liquidity to account for the firm's financial soundness. Green loans and green bond issuing bank (GB issuing) variables are defined as dummy variables. Bank, currency, credit type and industry fixed effects are included. The table shows the coefficients and p-values in parentheses; *, ** and *** denote significance at the 10%, 5%, and 1% levels, respectively. t-statistics are r reported in parentheses. The overall model fit shows that the amount equation (Adj. R2 = 0.41) is better fitted than the spread equation (Adj. R2 = 0.11).

The estimates do not provide evidence of a direct monotonic relationship between Taxonomy alignment and lending terms. Under the baseline specification we do not observe significant results, or a clear ordering from uncertain to partially aligned and finally to aligned green loans.

The specifications interacting the level of Taxonomy alignment with the green-bond-issuer indicator reveal substantial heterogeneity across banks. The results show that green loans reported as partially aligned with the EU Taxonomy, granted by non-GB issuing banks, receive higher loan amounts than green loans with uncertain alignment from non-GB issuing banks (+1.07/+0.98 log points). Compared to the same benchmark (green loans with uncertain alignment from non GB issuing banks), GB issuing banks tend to grant higher amounts for loans that are considered uncertain or partially aligned with the EU Taxonomy (+1.86/+1.66 log points for uncertain alignment, +1.9/+1.66 log points for partially aligned). However, these results are concentrated among a small number of institutions which account for a large share of partially aligned loans, but with no exposure to fully aligned loans. Aligned loans show a weaker effect (+0.57 log points more than the benchmark in Eq. 3) when granted by non-GB issuing banks. This can be explained by the type of loans granted, as for some the assessment of the criteria poses challenges. A study conducted by UNEP FI and EBF (UNEP FI, 2021) identified the challenges faced by banks in assessing the taxonomy alignment especially for certain product types, such as retail loans, trade finance and general purpose facilities. Due to data availability, proving some of the criteria such as the Do No Significant Harm (DNSH) and Minimum Social Safeguard (MSS), might be challenging due to lack of evidence of alignment and insufficient granularity. In the same avenue, a survey conducted by AFME shows that a significant challenge is that banks often lack the technical expertise to assess the DNSH criteria, especially for specialised lending. Data collection is also an obstacle due to inconsistency and unavailability, which makes it difficult to interpret the DNSH criteria. Consequently, these estimates may capture differences in banks' internal classification practices, portfolio composition or green-lending strategies, rather than the economic effect of a higher degree of Taxonomy alignment, as well as a bank-level emitter effect. Banks issuing green or sustainable bonds have better expertise to assess if a loan is green and to assign the accurate degree of alignment with the Taxonomy. As they have targeted resources from the bond issuance for this type of loan, they can grant higher loan amounts and better lending terms with regards to the pricing.

Spread effects are only significant in case of partially aligned loans granted by a green bond issuing banks (-1.33 percentage points in Eq. 4 compared to green loans with uncertain alignment from non-GB issuing banks). The degree of Taxonomy alignment itself does not necessarily ensure better lending terms for green loans, since the complete alignment with the taxonomy alone does not seem to drive the volume received nor the pricing. The state guarantee has consistently a large and significant effect across all equations and for both loan amount (+0.52-0.58 log points) and spread (-1.41-1.46 percentage points). The intuition is discussed above.

5. Conclusions

This paper investigates whether green loans granted by Romanian banks after the introduction of taxonomy-based reporting requirements in mid-2022 receive more favourable lending terms compared to a matched sample of non-taxonomy eligible loans. Drawing on the newly available dataset from the Romanian Central Credit Register, which identifies green loans and their degree of alignment with the EU Taxonomy, our analysis yields several key findings.

First, we find that banks, particularly those that have issued green or sustainability bonds for resolution purposes, tend to offer more favourable financing conditions to firms accessing green loans. This indicates that this category of banks might have greater expertise or a higher commitment to sustainable finance, which translates into advantages for green borrowers in the form of lower borrowing costs, and higher credit exposures. This is consistent with the international evidence that taxonomy-related measures can matter for debt pricing (Sautner *et al.*, 2026; Rizzato *et al.*, 2026; Boccaletti *et al.*, 2026), while extending it to a setting with loan-level data from an East European emerging economy.

Second, state guarantee schemes play a significant role in improving financing conditions for green loans, reinforcing the finding that public policy instruments can complement private green finance incentives. More targeted incentives to strategic sectors could add more value to the economy and create better synergies.

Third, and perhaps most notably, banks seem to differentiate lending terms based on the degree of EU Taxonomy alignment. Banks seem to finance companies which take partially aligned loans in higher amounts to fully aligned ones, perhaps due to the lower number of activities which qualify for stringent do no harm criteria. However, there is no clear evidence at this point for a direct monotonic relationship between the degree of the Taxonomy alignment and loan terms. This finding contributes to the emerging literature on partial alignment as an economically relevant state (Alessi *et al.*, 2024; Alessi & Battiston, 2022; Schütze & Sandbaek, 2025), suggesting that while the taxonomy classification infrastructure is in place, it has not yet translated into systematic pricing differentiation across alignment categories in the Romanian banking market.

Our study contributes to the literature in several ways. It provides some of the first direct evidence on how taxonomy-based reporting requirements affect bank lending terms using loan-level data, addressing the gap identified in the broader literature where most work has focused on disclosure, investor signaling, and market-level effects rather than the credit channel (Brabec & Macháč, 2025; Hummel & Bauernhofer, 2024; Kirschenmann, 2022). It also introduces the distinction between green loans with different degrees of taxonomy alignment into the empirical analysis, moving beyond the binary green versus non-green classification that dominates existing research. Furthermore, the Romanian setting provides a valuable

complement to the existing evidence base, which has been largely confined to listed firms, large borrowers, and Western European syndicated loan markets.

The results carry implications for policymakers and regulators. The finding that partial alignment generates higher lending volumes means that policymakers could consider improving the regulatory frameworks. This could include targeted supervisory guidance on how alignment information should be incorporated into credit assessment processes, further development of data infrastructure to reduce the costs of alignment verification, and the design of prudential or fiscal incentives that explicitly reward higher levels of (partial) taxonomy alignment. When designing reporting requirements, it is important to differentiate between degrees of Taxonomy alignment. Since the "green loan size premium" appears driven by borrower selection rather than the green label itself, policy should focus on helping smaller projects access green lending and on building standardised frameworks and knowledge-sharing platforms to evaluate green projects.

Future research should investigate whether the patterns documented here evolve as banks gain more experience with taxonomy reporting and as the regulatory framework matures.

Declaration of Generative AI and AI-assisted technologies in the writing process

The authors used Claude (Anthropic, Claude Sonnet 5), an AI-assisted editing tool, to assist with editing and to improve spelling, grammar and the clarity of the text, during manuscript preparation. After using this tool, the authors carefully reviewed and edited the text and take full responsibility for the final content.

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Appendix 1

Information on green lending

Table 1. Distribution of green loans by bank based on approved exposure

Bank	GB issuing bank	Total green approved exposure*	Mean green approved exposure*	No. of green of loans*	% of aligned or partially aligned approved exposure	% of aligned or partially aligned no of loans
Bank 1	No	32.8	0.8	41	90.9	92.7
Bank 2	Yes (2 issues)	1,165.0	12.5	93	90.2	86.0
Bank 3	No	65.5	3.9	17	100.0	100.0
Bank 4	No	717.2	3.0	242	0.0	0.0
Bank 5	Yes (2 issues)	1,883.0	2.0	942	100.0	100.0
Bank 6	No	64.9	21.6	3	0.0	0.0
Bank 7	No	5.5	0.3	17	100.0	100.0
Bank 8	No	468.2	3.1	150	49.1	46.7
Bank 9	No	17.7	0.1	124	0.0	0.0
Bank 10	No	1145.1	8.7	132	1.6	4.5
Bank 11	No	80.3	20.1	4	0.0	0.0
Bank 12	No	918.8	5.3	173	0.0	0.0
Bank 13	No	337.5	16.9	20	0.0	0.0
Bank 14	No	128.3	64.1	2	100.0	100.0
Bank 15	No	306.1	2.0	152	100.0	100.0
Bank 16	Yes (3 issues)	666.7	2.7	243	97.1	67.9
Bank 17	No	0.2	0.2	1	100.0	100.0
Bank 18	No	97.6	97.6	1	100.0	100.0
Total		**8,100.6**	**3.4**	**2,357**	**55**	**63**

*) Excluding debtors with no financial information. The table depicts the approved amount at origination, although for some green loans the outstanding amount is zero;^ GB issuing banks report no totally aligned green loans granted to firms.

Table 2. Distribution of green loans by NACE industry

Industry description (NACE rev. 2)	Total approved exposure (RON mn.)	Mean approved exposure (RON mn.)	No. of loans	% of aligned or partially aligned exposure	% of aligned or partially aligned no of loans
1 (Crop and animal production, hunting and related service activities)	336.9	1.1	293	68.9	86.3
2 (Forestry and logging)	11.5	0.6	18	84.1	72.2
3 (Fishing and aquaculture)	4.2	0.4	10	58.9	70.0
8 (Other mining and quarrying)	10.9	1.6	7	54.7	71.4
10 (Manufacture of food products)	75.0	1.2	64	51.2	71.9
11 (Manufacture of beverages)	14.7	2.4	6	55.8	50.0
13 (Manufacture of textiles)	1.7	0.6	3	12.2	33.3
14 (Manufacture of wearing apparel)	10.7	0.7	15	76.6	73.3
15 (Manufacture of leather and related products)	5.4	0.5	10	72.7	60.0
16 (Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials)	52.6	1.7	31	95.1	83.9
17 (Manufacture of paper and paper products)	149.7	8.8	17	6.1	47.1
18 (Printing and reproduction of recorded media)	14.4	1.6	9	96.3	77.8
20 (Manufacture of chemicals and chemical products)	5.2	2.6	2	100.0	100.0
21 (Manufacture of basic pharmaceutical products and pharmaceutical preparations)	12.0	4.0	3	17.1	66.7
22 (Manufacture of rubber and plastic products)	165.9	3.4	49	62.0	65.3
23 (Manufacture of other non-metallic mineral products)	70.2	2.2	32	84.3	59.4
24 (Manufacture of basic metals)	5.1	1.3	4	100.0	100.0
25 (Manufacture of fabricated metal products, except machinery and equipment)	85.2	1.9	44	43.8	63.6
26 (Manufacture of computer, electronic and optical products)	1.6	0.2	7	100.0	100.0
27 (Manufacture of electrical equipment)	1.2	0.4	3	-	-
28 (Manufacture of machinery and equipment)	12.2	0.6	19	74.7	89.5
29 (Manufacture of motor vehicles, trailers and semi-trailers)	31.3	3.5	9	6.0	22.2
30 (Manufacture of other transport equipment)	287.1	1.3	214	56.9	93.9
31 (Manufacture of furniture)	56.7	1.7	34	54.4	61.8
32 (Other manufacturing)	2.2	0.7	3	15.8	33.3
33 (Repair and installation of machinery and equipment)	1.6	0.8	2	-	-
35 (Electricity, gas, steam and air conditioning supply)	1,875.9	12.4	151	69.8	48.3

– continued –

Industry description (NACE rev. 2)	Total approved exposure (RON mn.)	Mean approved exposure (RON mn.)	No. of loans	% of aligned or partially aligned exposure	% of aligned or partially aligned no of loans
36 (Water collection, treatment and supply)	106.0	21.2	5	19.2	60.0
38 (Waste collection, treatment and disposal activities; materials recovery)	110.2	1.3	84	96.8	91.7
39 (Remediation activities and other waste management services)	0.1	0.1	1	100.0	100.0
41 (Construction of buildings)	1,395.9	10.4	134	32.5	35.8
42 (Civil engineering)	170.6	7.1	24	95.7	70.8
43 (Specialized construction activities)	26.4	1.0	26	54.7	61.5
45 (Wholesale and retail trade and repair of motor vehicles and motorcycles)	276.8	3.7	75	7.9	44.0
46 (Wholesale trade, except of motor vehicles and motorcycles)	306.5	2.0	152	30.0	60.5
47 (Retail trade, except of motor vehicles and motorcycles)	296.5	2.9	103	18.1	48.5
49 (Land transport and transport via pipelines)	47.8	0.8	58	80.5	69.0
51 (Air transport)	0.3	0.3	1	100.0	100.0
52 (Warehousing and support activities for transportation)	26.9	2.7	10	37.6	60.0
55 (Accommodation)	64.1	0.8	76	36.5	64.5
56 (Food and beverage service activities)	72.9	0.6	114	40.4	37.7
58 (Publishing activities)	2.7	0.9	3	92.6	66.7
62 (Computer programming, consultancy and related activities)	10.0	1.0	10	69.4	20.0
63 (Information service activities)	6.6	1.7	4	94.3	50.0
68 (Real estate activities)	1,210.8	10.9	111	98.3	87.4
69 (Legal and accounting activities)	4.2	0.7	6	11.0	16.7
70 (Activities of head offices; management consultancy activities)	32.4	2.2	15	69.8	46.7
71 (Architectural and engineering activities; technical testing and analysis)	94.0	3.8	25	48.5	64.0
73 (Advertising and market research)	1.5	0.3	6	56.1	33.3
74 (Other professional, scientific and technical activities)	1.5	0.4	4	13.8	25.0
75 (Veterinary activities)	2.2	1.1	2	-	-
77 (Rental and leasing activities)	52.0	0.4	148	47.0	15.5
78 (Employment activities)	1.0	1.0	1	100.0	100.0
79 (Travel agency, tour operator reservation service and related activities)	1.3	0.7	2	-	-
81 (Services to buildings and landscape activities)	0.2	0.2	1	100.0	100.0
82 (Office administrative, office support and other business support activities)	430.0	26.9	16	0.0	6.3
85 (Education)	22.6	4.5	5	7.1	60.0

– continued –

Industry description (NACE rev. 2)	Total approved exposure (RON mn.)	Mean approved exposure (RON mn.)	No. of loans	% of aligned or partially aligned exposure	% of aligned or partially aligned no of loans
86 (Human health activities)	19.2	0.3	57	87.3	87.7
87 (Residential care activities)	0.5	0.2	2	100.0	100.0
93 (Sports activities and amusement and recreation activities)	4.3	0.4	12	50.1	50.0
95 (Repair of computers and personal and household goods)	0.3	0.2	2	40.1	50.0
96 (Other personal service activities)	1.1	0.4	3	83.5	66.7
Total	**8,100.6**	**3.4**	**2,357**	**55.1**	**63.3**

Table 3. The breakdown of green lending by alignment and different categories (May 2022 – April 2025), by number of loans

percent

	Unique debtors (by number)						Unique loans (by exposure)					
	Non green loans	Green, *out of which:*	not aligned	uncertain alignment	partially aligned	aligned	Non green loans	Green, *out of which:*	not aligned	uncertain alignment	partially aligned	aligned
Breakdown of green debtors/ loans			0.8	37.5	57.4	4.2						
New loans*	96.7	99.8	100.0	99.0	97.4	100.0	88.5	89.7	99.5	91.4	87.3	99.9
% with state guarantee (% total)	26.6	41.1	6.7	11.7	10.4	6.6	18.	2.1	1.1	1.9	2.1	4.0
% with state guarantee (COVID-19)	10.4	18.9	6.7	3.4	2.8	1.3	4.9	0.6	1.1	0.7	0.6	0.0
% granted by banks reporting the previous decade**	92.6	89.3	80.0	53.2	99.8	57.9	88.6	92.6	74.1	78.6	100.0	96.6
% Green debtor/ loans granted by GB issuing banks***	64.2	69.9	0.0	19.7	86.8	1.3	42.4	63.5	0.0	18.3	95.2	6.4
% debtors which took both green and non-green loans (natural matching sample)		71.1	60.0	66.8	74.6	61.8						
% debtors with green loans that took other loans 2 years before the reporting requirement (May 2022)		63.8	73.3	63.9	63.5	60.5						

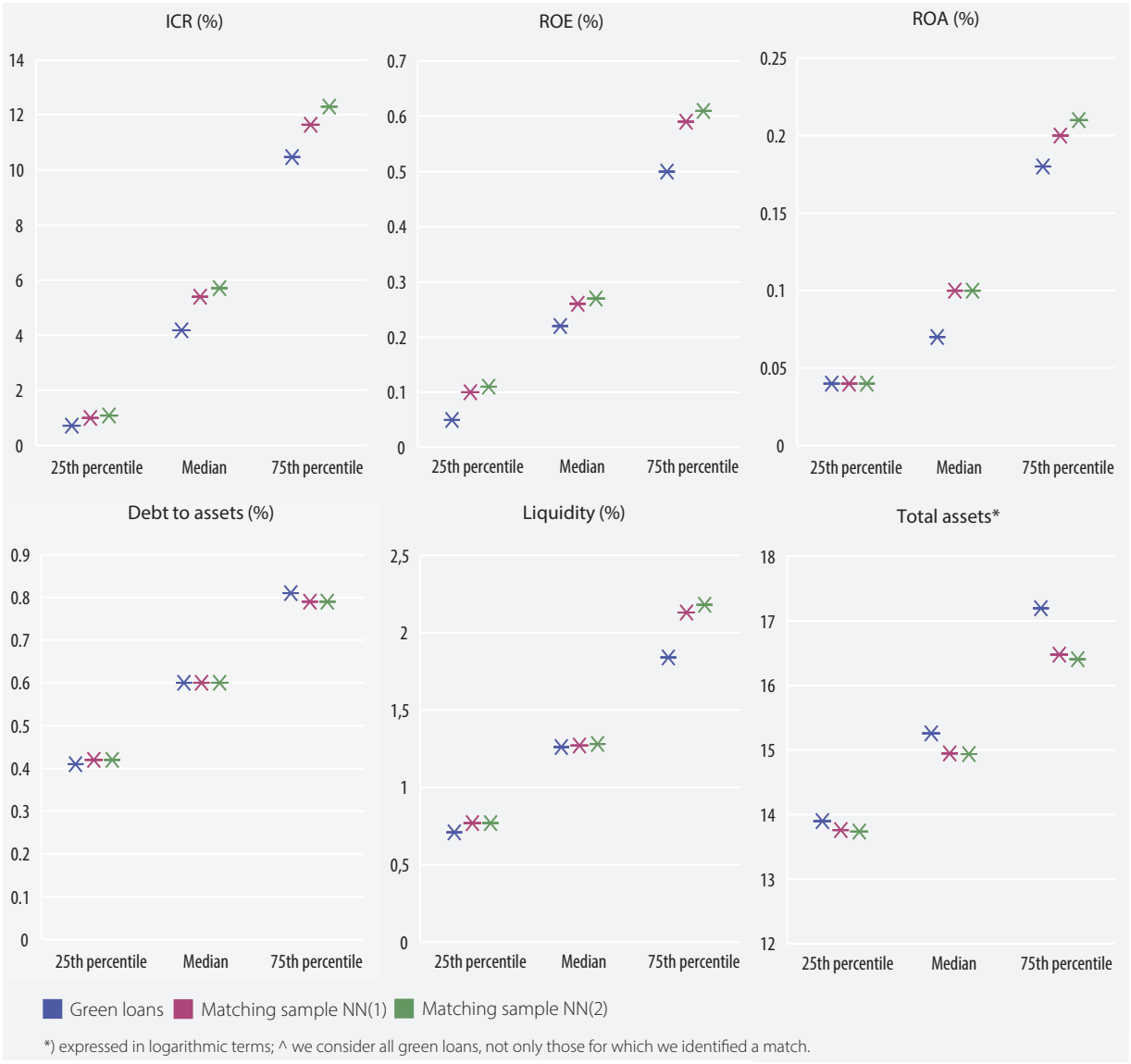
*) Loans originated between 2022-2025 and for which refinancing/restructuring was applied were excluded; **) A sample of banks that reported one-off the green loans granted between 2010-2020; Green banks accounts for the three banks that issued sustainable or green bonds for resolution purposes.

Note: All shares are calculated with respect to green loans and respectively those 4 categories differentiated by alignment with the EU Taxonomy (for e.g. the value of 94% of new green loans represents the share of green loans that are marked as new (not restructured old loans) in the total number of green loans that we identify in the database).

Appendix 2

Propensity score matching

Figure 1. Financial indicators for green debtors^ and matched debtors

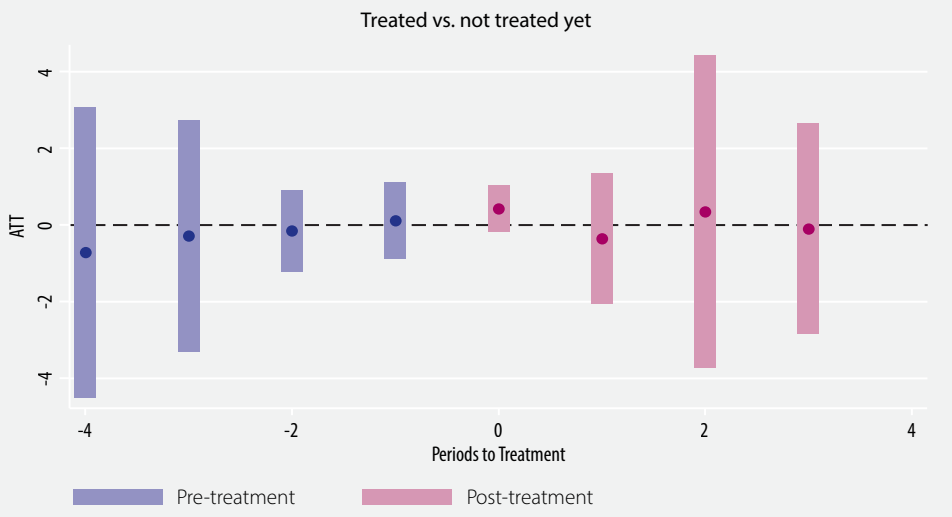


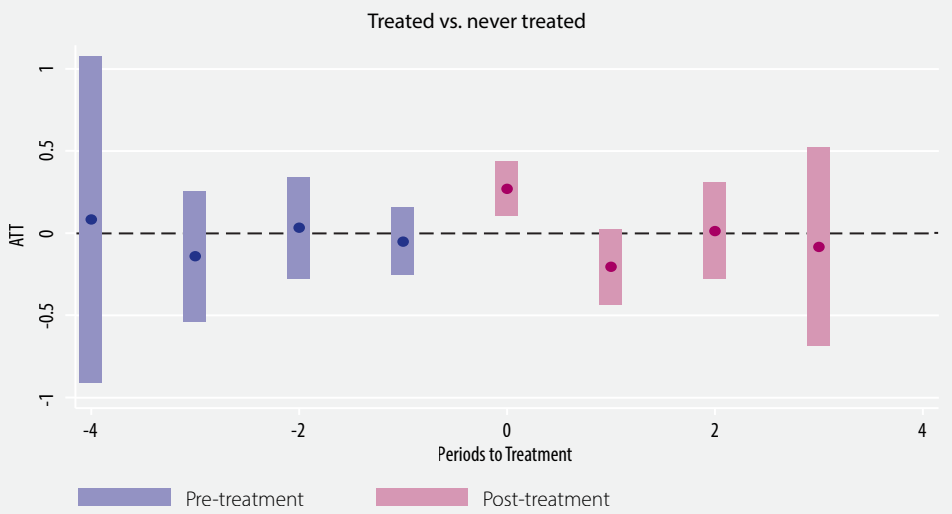
*) expressed in logarithmic terms; ^ we consider all green loans, not only those for which we identified a match.

Appendix 3

Difference in difference using CSDID – outstanding loan amount at origination

Debtors raise substantially more for their first taxonomy eligible loan, followed by a smaller amount in the subsequent year.





Note: We analyse the relationship at firm-bank-year level. The green debtor definition is based on the approved amount at origination, i.e. a debtor is considered green if the share of green loans approved amount in total loans taken is equal or above 50%.