The Efficiency of the Sustainability-Linked Bond Market for a Successful Sustainability Transition

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Summary: In order to reach climate neutrality by 2050, the European Union is taking action in the form of extensive sustainability regulations with the aim to push the private sector towards sustainable economic activities. In this context, a new instrument to finance a company's sustainability transition has been developed: the sustainability-linked bond (SLB). This paper analyzes the SLB market's efficiency in attracting those companies that are most crucial for a successful sustainability transition, namely carbon-intensive companies and companies that are lagging behind in their sustainability transition, defined as ESG laggards. By developing a conceptual framework for the SLB market and running a probit and logit regression estimation, this paper shows that the SLB market efficiently attracts carbon-intensive companies, but fails to attract ESG laggards. Moreover, the paper identifies four success factors for the SLB market to improve its future accessibility and credibility.

Zusammenfassung: Für die Transformation der europäischen Wirtschaft mit dem Ziel der Klimaneutralität bis 2050 hat die Europäische Union in den letzten Jahren weitreichende Nachhaltigkeitsverordnungen beschlossen. Diese sollen insbesondere den Privatsektor in die Richtung nachhaltiger wirtschaftlicher Aktivitäten lenken. In diesem Zusammenhang wurde ein neues Finanzierungsinstrument entwickelt, das die Nachhaltigkeitstransformation eines Unternehmens finanzieren soll: die Sustainability-Linked (SL) Anleihe. Diese Arbeit untersucht, inwiefern der SL-Anleihemarkt besonders diejenigen Unternehmen anzieht, die für eine erfolgreiche Nachhaltigkeitstransformation notwendig sind. Dies sind Unternehmen aus emissionsintensiven Industrien und Unternehmen, die mit ihrer Nachhaltigkeitstransformation im Rückstand sind, sogenannte Nachhaltigkeitsnachzügler. Mithilfe eines Probit-Regression Modells analysiert diese Arbeit die Marktstrukturen und zeigt, dass der SL-Anleihemarkt zwar Unternehmen aus emissionsintensiven Industrien anzieht, aber nicht die ebenfalls

→ JEL classification: C25, G10, G14, G18, G38, Q01, Q58
→ Keywords: Sustainable Finance, Sustainability-Linked Bonds, Transition Financing, Sustainable Investing, ESG, Market Efficiency

DOI https://doi.org/10.3790/vjh.92.3.91

erforderlichen Nachhaltigkeitsnachzügler. Basierend auf den Ergebnissen definiert die Arbeit zudem vier Erfolgsfaktoren, um die Attraktivität und Glaubwürdigkeit des SL-Anleihemarktes zu verbessern.

We would like to thank Marcus Pratsch, Bettina Streiter, Franziska Lamprecht, Klaus Thuß, Jasmin Tur, Florian Moser and Anna-Maria Maurer for intriguing discussions, valuable input and support. Furthermore, we thank participants in the DIW/DSGV-Workshop in Berlin, May 11–12, 2023, and an anonymous reader for their helpful comments and suggestions. The usual disclaimer applies.

1 Introduction

The nations of the world are confronted with the challenge of climate change, as well as its ecological and societal consequences. They therefore increasingly make use of policy tools that try to achieve a transition towards more sustainable economic activities. The development of public policies to address climate change is known in the United States as the Green New Deal, whilst the European Union (EU) has adopted the European Green Deal. The latter, with a total promised budget of €600 billion, has set the political goal to reduce greenhouse gas emissions drastically and to become climate neutral by 2050 (European Commission 2023a). However, public sector investments alone are insufficient to reach this target.

Consequently, the EU introduced the European Green Deal Investment Plan, which incorporates three extensive legislations regarding the classification of sustainable activities, as well as transparent sustainability reporting and benchmarks. These regulatory requirements increase the pressure on the private sector to transition towards sustainable economic activities, thereby acquiring the necessary investments for a successful sustainability transition. The financial sector plays a key role in the implementation of these regulations. It has, on the one hand, incorporated sustainability criteria into investment and credit assessments to push investments towards sustainable activities and, on the other hand, developed specific financial instruments to finance particularly the sustainability transition.

A prominent example is the sustainability-linked bond (SLB), for which the issuer needs to set company-level sustainability targets in line with their economic activities and pays a financial penalty in the case of failure to achieve these targets, for instance in the form of a coupon step-up (ICMA, 2020). Thereby, the SLB is an attractive instrument for companies to communicate their transition strategy. It might even present an opportunity for issuers to receive a lower yield, a so-called premium, than they would have received for a comparable conventional bond (Berrada et al. 2022, Kölbel and Lambillon 2022). Consequently, the SLB market has been growing rapidly in the last few years. Nevertheless, investors also show concern regarding the credibility and greenwashing potential of SLBs, especially in regard to the ambitiousness and materiality of sustainability targets and transition pathways (Vulturius 2022).

So far, research has focused on the pricing and credibility of sustainability-linked instruments, but the existing literature has not yet considered the efficiency of the SLB market in attracting those companies that are most crucial for a successful sustainability transition. For a successful sustainability transition, carbon-intensive industries are imperative, as they promise the potential of high overall carbon emission reductions. Moreover, within the carbon-intensive industries, com-

DOI https://doi.org/10.3790/vjh.92.3.91

panies vary greatly in their progress to decarbonize and to transition their economic activities towards sustainability. Refinitiv sustainability ratings represent a company's relative sustainability performance respective to the industry level and thereby allow to differentiate between ESG leaders and ESG laggards, the latter defining companies which are lagging behind in their sustainability transition. In order to ensure an economy-wide successful sustainability transition, the SLB market should attract particularly carbon-intensive industries and ESG laggards. But does the SLB market efficiently attract this target group?

This paper answers the question by developing a conceptual framework of the SLB market and subsequently testing the SLB market structures and accessibility to the relevant target groups using a probit choice model. Based on the increasing pressure for transformation due to the implementation of sustainable finance regulations and the assumption of an efficient SLB market, carbon-intensive industries and ESG laggards should have a higher probability to issue a SLB. Moreover, the framework defines eight market, company and financial characteristics that could influence a company's probability to issue a SLB through the established SLB market structures.

The results show that the SLB market does indeed efficiently attract carbon-intensive industries. Being a company from the carbon-intensive materials or utilities sector more than triples the probability to issue a SLB. However, the SLB market does not efficiently attract ESG laggards. In fact, companies that have a below-average sustainability performance within their respective industry, and are thus considered ESG laggards, have an 80 % decrease in the probability to issue a SLB.

The paper is structured as follows: section 2 gives an introduction to transformation policy measures and financing instruments, as well as the sustainability-linked bond market, and relates it to the relevant literature on sustainability-linked bonds. Section 3 develops the conceptual framework for the SLB market structures and section 4 defines the data sample and empirical methodology. Section 5 presents the findings of the regression analysis in regard to the SLB market's efficiency, as well as the impact of the market, company and financial characteristics. Finally, section 6 identifies four success factors for a further improvement of the SLB market and concludes by suggesting areas for future SLB market research.

2 Literature Review

2.1 The European Green Deal Investment Plan

In December 2019, the European Commission presented the European Green Deal, with the aim to transform the European Union (EU) into a modern, resource-efficient and competitive economy (European Commission 2023a). One of the biggest goals is to reduce greenhouse gas emissions by at least 55 % by 2030 and to be climate-neutral by 2050. In order to achieve these targets, Europe requires between €175 and €290 billion in annual sustainability transition investments for the upcoming decades (European Commission 2020a). The EU has committed to contribute €600 billion for the sustainability transition through the EU budget and the Next Generation EU Recovery Plan, but this public sector contribution is far from closing the green finance gap (European Commission 2023a). Consequently, the EU developed a European Green Deal Investment Plan, which was published in January 2020 and plans to mobilize at least €1 trillion of sustainable investments over the next decade, primarily through the private sector (European Commission

DOI https://doi.org/10.3790/vjh.92.3.91

2020a). The investment plan entails three main legislations, which are supposed to incentivize and channel private sector investment into a green and sustainable transformation.

The first key legislation is the EU Taxonomy, which is a unified classification of economic activities in regard to their sustainability contributions (European Commission 2021). This is supplemented by several disclosure legislations, such as the Sustainable Finance Disclosure Regulation (SFDR) and the Non-Financial Reporting Directive (NFRD), which will soon be replaced by the Corporate Sustainability Reporting Directive (CSRD)[1]. These legislations ensure improved transparency concerning non-financial information, which is necessary for investors to make informed sustainable investment decisions (European Commission 2021). Finally, the EU has developed several tools to aid companies and financial intermediaries in setting ambitious sustainability goals and preventing greenwashing. This includes the EU Climate Benchmark Regulation, which consists of the EU climate transition and Paris-aligned benchmarks[2].

2.2 Transition Financing

Through the three key legislations, the EU Green Deal Investment Plan increases transparency and improves the disclosure of non-financial information, thereby pushing the private sector towards more sustainable economic activities (Schütze and Stede 2021). For the successful implementation of these legislations, the financial sector is being actively involved to adopt the regulatory requirements in the form of adjusted financing instruments and revised risk assessment methods that incorporate sustainability criteria, among others. Moreover, financial institutions are expected to ensure the climate-alignment[3] of their portfolios and are thereby driven to increase low-carbon investments and to support the transition of carbon-intensive sectors (Platform on Sustainable Finance 2021). Among the most prominent tools to advance the economy's sustainability transition are sustainable finance instruments. In order to ensure a real economic impact, the instruments need to encourage Paris-aligned economic activities, which means activities in line with the goals of the Paris Agreement, such as limiting global warming to well-below 2 °C, and to enable issuers to manage their climate-related risks (Caldecott 2020). For instance, sustainable finance instruments can incentivize companies to align their practices to a zero-emission future by reducing the cost of capital for Paris-compatible activities (Caldecott 2020).

One of the most influential levers for a company's sustainability transition is debt financing, which led to the growing market of transition financing. Transition financing can be divided into two major categories, use of proceeds instruments and sustainability-linked instruments[4]. Use of proceeds instruments are characterized by the restrictive allocation of proceeds to classified environmental or socially beneficial projects (CBI 2022a). The most common use of proceeds in-

1 The SFDR defines sustainability disclosure obligations for financial institutions and financial advisors. The NFRD requires companies to report on both, how climate change affects their business and how their business impacts the climate. On January 5th 2023, the NFRD was replaced by the CSRD, strengthening the reporting rules and expanding the mandatory corporate sustainability reporting to a larger set of companies (European Commission 2023b).

2 The EU climate transition benchmark (EU CTB) and the EU Paris-aligned benchmark (EU PAB) aim to improve ESG transparency and comparability among benchmarks, as well as to provide minimum technical requirements to avoid greenwashing (European Commission 2023b).

3 A climate-aligned portfolio takes into account the necessary emission reductions to reach the 1.5 °C target.

4 In some cases, the two instruments are combined, leading to a green sustainability-linked bond, for example.

DOI https://doi.org/10.3790/vjh.92.3.91

strument is a green bond, which allocates all proceeds to a predetermined climate or environmentally valuable project (Hinsche 2021). In contrast, sustainability-linked instruments allow for proceeds to be used for general purposes, thereby taking a company-level sustainability perspective, rather than a project focus (ICMA 2020). One prominent example of this category is the sustainability-linked bond.

2.3 Sustainability-Linked Bonds

According to the Sustainability-Linked Bond Principles (SLBP), a SLB is a financial instrument, which defines company-level sustainability targets and demands a penalty, for example in form of a coupon step-up, if the company should fail to meet its targets (ICMA 2020). In advance of the issuance, the company defines Key Performance Indicators (KPIs) that measure the respective sustainability targets, as well as Sustainability Performance Indicators (SPTs), which indicate the desired level of the KPIs[5]. Both, KPIs and SPTs, are reported in the SLB Framework, as well as the timeline for the achievement of the KPIs. Moreover, the issuer decides which bond characteristic they would like to tie to the fulfillment of the KPIs and what the penalty scenario should be. The most commonly used bond adjustment in case of failure to reach the sustainability targets is a coupon step-up (Vulturius, Maltais and Forsbacka 2022). The International Capital Markets Association (2020) recommends that the SLB Framework is verified through an external and independent party in form of a Second Party Opinion, certifying that the SLB issuance is in line with the SLBP.

2.4 Sustainability-Linked Bond Market

Sustainability-linked instrument issuances have increased rapidly in the last three years, with sustainability-linked bonds being the fastest-growing segment of the sustainability bond market (Vulturius et al. 2022). SLBs make up 11 % of total sustainable finance debt issuances in the first half of 2022, even though the first SLB was issued only in December 2018 (CBI 2022a). The growth is likely driven by the fact that SLBs can be used by a broader range of issuers compared to green bonds. For instance, companies that would not be able to issue a green bond, due to insufficiently large capital expenditures connected to a potential sustainability project, can issue a SLB (CBI 2022a). Moreover, companies can use existing company-level sustainability performance indicators and reporting structures to set KPIs and SPTs, instead of setting up project-level tracking and reporting practices. This is especially attractive for smaller issuers, as it lowers issuance costs. Furthermore, SLBs offer companies the opportunity to signal their sustainability strategy and give them more flexibility in how to use the proceeds to achieve their successful sustainability transition (Liberadzki, Jaworski and Liberadzki 2021). This is crucial, especially for carbon-intensive industries, because financial institutions are increasingly incorporating sustainability indicators in their risk assessments and credit analysis (BaFin, 2019). Consequently, companies have to be able to either already perform well in regard to their sustainability or to provide a credible transition plan to improve their sustainability.

5 KPIs can consist of environmental, social, as well as governance criteria and can either be measured by an external ESG rating or predefined metrics, for example greenhouse gas (GHG) emission intensity. SPTs set the desired level of achievement, which in the case of a greenhouse gas emission (GHG) intensity metric would be measured in gCO2/kWh.

DOI https://doi.org/10.3790/vjh.92.3.91

The increased demand for SLBs has fueled a discussion about the pricing mechanisms and the existence of a potential premium for issuers, similar to the so-called Greenium in the green bond market. Even though the existence of a Greenium in the green bond market is still being debated (Hinsche 2021) and the SLB market is still very young, there are two research papers which try to detect a potential premium for SLB issuers. Kölbel and Lambillon (2022) apply a matching method in their research, which has also been used in a similar manner to calculate a potential green bond premium (Zerbib 2019, Larcker and Watts 2020, Flammer 2021). They find a statistically significant average sustainability premium of -29.2 bps, indicating that issuers can benefit from a SLB issuance. Employing a similar method, an analysis by the Climate Bond Initiative (2022b) supports these results, as they find 14 SLBs in the years 2021 and 2022 that were priced with a significant premium, ranging from -4 bps to -34 bps.

Moreover, Kölbel and Lambillon (2022) show that the average penalty coupon step-up is lower than the average sustainability premium, indicating that companies could benefit from lower costs of capital even in the scenario that they fail to achieve their sustainability performance targets. These results suggest that there could be a "free lunch" for SLB issuers. However, the authors also point out that one-third of SLB issuers do not benefit from a premium at all, showing that the SLB market is still very young and that pricing mechanisms are very volatile. The second paper searching for a potential SLB premium, by Berrada et al. (2022), makes use of a one-period SLB pricing model to measure and analyze the potential mispricing of SLBs. The authors demonstrate that one-quarter of SLBs is overpriced at issuance and will experience a following price drop in the secondary market. This indicates that the industry overestimates SLB issuance benefits, which leads to a price premium for issuers (Berrada et al. 2022).

2.5 Risks and Challenges for Sustainability-Linked Bonds

As explained above, SLBs offer a great opportunity for companies to finance their sustainability transition. However, researchers and financial market participants are also pointing out potential problems in regard to a SLB's credibility and effectiveness. For instance, the ICMA (2020) recommends using science-based emission targets to ensure that a company's sustainability transition is Paris aligned. However, it does not define how to evaluate a KPI's and SPT's ambitiousness in relation to different sectors and how to assess the target's materiality regarding the company's sustainability transition (Vulturius 2022). Consequently, companies might choose more feasible SPTs, thereby decreasing a SLB's transition effectiveness. Moreover, as SLBs are general-purpose instruments, investors are skeptical about the lack of transparency regarding the use of proceeds and their contribution to the issuer's sustainability transition (Liberatore 2021).

Furthermore, investors are skeptical about whether the penalty coupon step-up is high enough in most cases, to ensure sufficient incentivization for companies to prioritize their sustainability transition. In fact, Kölbel and Lambillon (2022) show that companies might benefit from a "free lunch", suggesting that SLB penalty coupon step-ups are not high enough. Finally, SLB investors are concerned about the potential reputational harm of profiting from a margin adjustment in case the SLB issuer should fail to reach their targets (Wass 2021). Overall, there is substantial greenwashing concern from both, the issuer side in regard to choosing the right KPIs and SPTs, as well as the investor side (Natixis 2021).

So far, research has focused on the functionality of a SLB's incentive characteristics and the pricing mechanisms in the market. However, in order to ensure a successful transition towards a zero-

DOI https://doi.org/10.3790/vjh.92.3.91

emission economy, the type of SLB issuer is crucial as well. In fact, high-emitting sectors are imperative for an economy-wide transition (CBI 2022a). Moreover, within these high-emitting sectors, companies differ vastly in their progress with regard to decarbonization and their sustainability transition. Refinitiv (2022) calculates ESG[6] ratings that evaluate a company's sustainability level relative to the respective industry level. For instance, Shell PLC, one of the biggest oil and gas companies worldwide, has a Refinitiv ESG Rating of A+, which marks it as an ESG leader (Refinitiv 2023). Even though the industry itself is very carbon-intensive, Shell PLC has the best sustainability performance relative to all 404 rated companies in the oil and gas industry. Taking this into consideration, a successful transition not only includes carbon-intensive industries but especially needs to target companies that are falling behind, subsequently termed as ESG laggards. Consequently, an efficient SLB market with the goal of a successful economy-wide sustainability transformation requires accessibility and market structures that particularly attract carbon-intensive industries and ESG laggards.

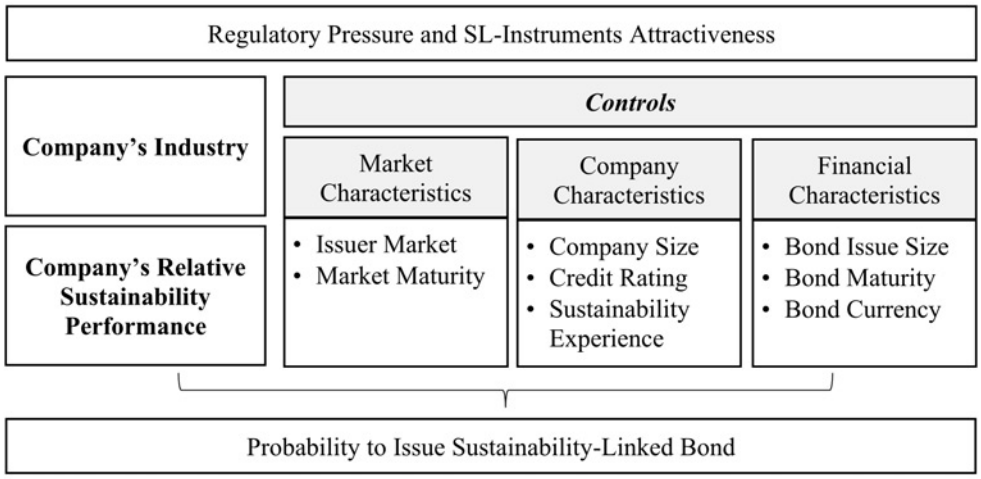
3 Conceptual Framework

The following section develops a conceptual framework to assess the efficiency of the regulatory pressure for transformation and the SLB market in attracting those companies that are crucial for a successful sustainability transition. With the overarching goal to achieve the 2 °C Paris target, the sustainability legislations should create pressure particularly for carbon-intensive industries and ESG laggards to transform their economic activities, as explained above. Complementary, the SLB market should offer an attractive environment for these companies to finance their sustainability transition. The efficiency of the sustainability legislations and the SLB market in attracting carbon-intensive industries and ESG laggards is measured through the probability to issue a SLB. Based on the pressure for transformation through regulatory requirements and the assumption of an efficient SLB market, carbon-intensive industries and ESG laggards should have a higher probability to issue a SLB compared to low-carbon industries and ESG leaders. The subsequent analysis tests this hypothesis by estimating the probability to issue a SLB based on a company's industry and sustainability performance, while controlling for influential market, company and financial characteristics. The following framework defines the potential criteria which could represent either possible barriers to entering the SLB market or opportunities to more precisely address carbon-intensive ESG laggards. As seen in Figure 1, the framework divides the potentially influential factors into five broad categories, including a company's industry and relative sustainability performance, as well as market, company and financial characteristics

6 ESG ratings contain ecological, social and governance criteria to assess a company's sustainability level.

DOI https://doi.org/10.3790/vjh.92.3.91

Figure 1: SLB Market Structure



Source: Isabelle Hinsche

3.1 Sustainability Transformation Target Groups

Due to the fact that companies from carbon-intensive industries have a higher pressure to implement their sustainability transformation, as explained above, they should have a higher probability to issue a SLB to obtain debt financing and to communicate their transition strategy. As of January 27th 2023, there are 773 SLBs outstanding, with the majority of issuers coming from the industrials (19 %), materials (17 %) and utilities (15 %) sectors. This indicates that companies from carbon-intensive sectors are already present in the SLB market. Nevertheless, the SLB market might be less receptive to carbon-intensive companies, due to investor concern regarding greenwashing and transition credibility, as explained above. Consequently, companies from carbon-intensive industries would have to overcome a higher entry barrier to the SLB market than low-emission companies, making them more hesitant to choose a sustainability-linked structure for their financing instrument.

Moreover, companies that are lagging behind in terms of their sustainability performance and transition should have a higher incentive and consequently a higher probability to issue a SLB. However, in order to issue a SLB, companies have to choose appropriate KPIs and SPTs. This process is likely easier for companies that already have an existing sustainability strategy or are at least aware of their own sustainability performance, for instance in the form of an ESG rating. Moreover, an ESG rating might also improve a company's transition credibility amongst sustainability investors. The influence of sustainability knowledge and credibility in the sustainable finance market would suggest that companies which lack an ESG rating might have to overcome a higher barrier to enter the SLB market.

3.2 Market Characteristics

Market characteristics might influence the probability to issue a sustainability-linked instrument through several channels. First, the level of adaptation of sustainability regulations can differ between countries and consequently lead to varying supportive environments. For instance, Steffen (2021) shows that even though a lot of green financial policies are decided on the EU level, adaptations on a country level can diverge. By conducting a comparative analysis of green financial policy output among OECD countries, he shows that France, UK and the Netherlands have the highest green financial policy density among European countries. This is supported by findings from D'Orazio and Thole (2022), who develop an index to analyze country-level engagement in climate-related policies. According to their results, France and the Netherlands have the highest climate-related financial policy index (CRFPI) followed by Germany, UK and Sweden. Moreover, not only do countries differ in regard to the number of sustainability regulations but D'Orazio and Thole (2022) also find that a higher density of regulations has a significant impact on climate change mitigation. D'Orazio and Dirks (2022) demonstrate that both, short-term and long-term climate-related financial policies have a negative effect on a country's carbon emissions. This shows that the density and the type of country-level regulations create differing market environments that ultimately affect an economy's transition outcome. Consequently, the issuer market could likely influence the probability to issue a SLB. Furthermore, a more mature SLB market, with a higher number of established issuers and lower pricing volatility, is likely to attract more companies. Overall, the issuer market and the SLB market's maturity could potentially influence the probability to issue a SLB.

3.3 Company Characteristics

Regarding the potential influence of company characteristics, the first aspect is a company's size. As the EU sustainability legislations apply to companies based on their employee count, smaller companies might not need to adhere to regulations such as the NFRD[7] yet and are therefore exposed to a lower regulatory pressure than larger companies. Moreover, issuing a financing instrument with a sustainability structure involves additional costs in terms of both, financial and administrative costs (Gianfrate and Peri 2019). These costs are relatively lower for larger companies, as they primarily consist of a fixed component, and could thereby influence a company's probability to issue a SLB. Secondly, the company's financial background, measured in terms of credit rating, could also have an effect on a potential SLB issuance. On the one hand, if a company has a lower credit rating than competitors, it could aim to improve the attractiveness of its financing instrument by choosing a sustainable structure. On the other hand, the SLB market could be less receptive to issuers with a low credit rating, creating a market barrier. Finally, a company's experience with sustainable financing instruments might have an influence on the probability to issue a SLB as well. For instance, if a company has already issued another type of sustainable financing, such as a green bond, they might profit from an existing sustainability reporting structure, as well as an established credibility amongst investors and consequently confidence regarding the use of sustainable financing instruments.

7 The NFRD currently applies to public-interest companies with an employee count larger than 500 (European Commission 2023b).

DOI https://doi.org/10.3790/vjh.92.3.91

3.4 Financial Characteristics

The last category of potentially influential factors are financial characteristics, representing the company's financing needs. First, the company's desired issue size for the financing instrument could play a role in the decision regarding a sustainability-linked structure. Because the issuance of a sustainability-linked instrument is relatively more costly, as explained above, a company might be more likely to choose a sustainability-linked structure for a larger issuance size, especially if they hope to profit from a pricing premium compared to a conventional bond structure. Moreover, also the desired financing length and currency could potentially influence the decision for a SLB issuance. Overall, the conceptual framework has identified eight different market, company and financial characteristic channels (see Figure 1) that could influence the probability of a SLB issuance, apart from a company's industry and sustainability performance, and whose respective significance and effect will be assessed in the next section.

4 Methodology

4.1 Probit Choice Model

Based on the developed conceptual framework for the SLB market in section 3, the following analysis uses a probit choice regression model to assess whether the current regulatory pressure for transformation and the SLB market structures successfully attract carbon-intensive industries and ESG laggards. For this purpose, the regression estimates a company's probability to issue a SLB based on its industry and relative sustainability performance. The binary outcome variable is the observation that the bond has a sustainability-linked structure or not. The independent variables are chosen according to the influential factors determined in the conceptual framework. The subsequent regression analysis determines the significance of the respective independent variables and the likelihood of a sustainability-linked structure based on the assessed significant factors, using a standard normal cumulative distribution function. The robustness of the analysis will be tested by additionally running the regression using a logit choice model, based on a logistic cumulative distribution function. Finally, the respective risk ratios of the significant influential factors will be calculated based on the logit regression coefficients, in order to obtain a comparable measure of influence.

4.2 Data and Sample Selection

The analysis focuses on the European SLB market, more precisely on countries for which the European sustainable finance legislations, such as the EU Taxonomy and NFRD, apply and for which issuers are thus embedded in a common regulatory environment with a unified understanding of sustainability. Consequently, it only includes issuer entities that are part of the European Union. The first SLB in the European market was issued by Enel S.p.A. on 10.09.2019. Therefore, the database includes all public bond issuances from 01.09.2019 until 02.11.2022. Moreover, as the analysis wants to evaluate the efficiency of the SLB market structures, the market itself should have reached a certain level of maturity, in order to reduce potential effects due to the infancy and volatility of the market. Therefore, the sample only includes SLB markets that have at least five different SLB issuers on a country level. Finally, this paper focuses on the SLB market mechanisms and the sustainability transition of the real economy. Therefore, the sample excludes financial and governmental institutions as bond issuers. Applying these rules to the database, the

final sample consists of 2,138 bonds, including normal, green, sustainability, social and (green) sustainability-linked bonds. The primary data source for the identification of the bond sample and the subsequent analysis is Bloomberg, as well as Refinitiv for the companies' ESG and environmental rating data. The respective Bloomberg and Refinitiv data points are matched based on the individual bond's ISIN.

4.3 Data Summary

The sample includes 823 companies that have issued at least one bond in the time from 01. 09. 2019 until 02. 11. 2022, out of which 85 companies have issued at least one SLB. France has the highest number of companies that have issued at least one SLB, in the following denoted as SLB companies, followed by Luxembourg and the Netherlands. Austria and Germany only have six SLB issuers each, but Austria has the highest density of SLB issuers. In fact, more than a quarter (27 %) of the companies that were active in the debt financing market from 2019 until 2022 have issued a SLB. The majority of SLB companies comes from the materials (21 %), industrials (16 %) and consumer discretionary (16 %) sector. This is in line with the observation by CBI (2023) that the worldwide SLB market already includes some issuers from carbon-intensive sectors.

Concerning companies' sustainability performance, 14 % of currently ESG-rated companies have issued a SLB, compared to only 8 % of non-ESG-rated companies. This could indicate that an ESG rating increases the probability to enter the SLB market. However, the biggest group of sustainability-linked issuers (38 %) does not have an ESG rating, indicating that an ESG rating might not necessarily be an entry barrier to the market. Taking a closer look, the majority of companies that have an ESG rating at the time of issuance either have an A+, A or A- rating. In fact, 26 % of companies with an A+ ESG rating, which thereby belong to the top sustainability performers within their respective industries, have issued a SLB. This suggests that the majority of SLB issuers already have an above-average sustainability performance and that the SLB market includes almost no sustainability laggards. A more comprehensive data summary can be found in the extended version of this paper[8] (see Hinsche and Klump 2023, Table 1 and 2).

4.4 Empirical Methodology

As explained above, the following analysis uses a probit choice regression model to estimate a company's probability to issue a SLB based on potentially influential factors. The base regression model for studying the effect of a company's industry and controlling for market, company and financial characteristics can be seen in equation 1, with further variables for the issuer's sustainability performance being added in the subsequent analysis.

$$(1)\quad Pr(SLB = 1) = \Phi(ß_0 + ß_1 * Industry + ß_2 * Control\ Variables)$$

The term Φ defines the standard normal cumulative distribution. *SLB* is a binary dependent variable that denotes whether a bond has a sustainability-linked structure (*SLB*=1) or not (*SLB*=0). The independent categorical variable *Industry* captures the company's sector according to Bloomberg's BICS classification system. A company's relative sustainability performance is

8 Hinsche, I.C. and Klump, R. (2023). Mirror, Mirror on the Wall, Who Is Transitioning Amongst Them All? Center for Financial Studies Working Paper, 712, 2023, Available at SSRN: https://ssrn.com/abstract=4464312 or http://dx.doi.org/10.2139/ssrn.4464312.

measured using the company's Refinitiv ESG rating, which represents a company's ESG performance relative to its respective industry level. The variable *ESGRating* defines the companies' relative sustainability performance based on their respective Refinitiv ESG ratings, namely being a sustainability leader (A+ to B-), a sustainability laggard (C+ to D-) or having no ESG rating. The classification as a sustainability leader or laggard is based on the definition by Refinitiv (2022) that companies with an ESG rating of A+ to B- have a sustainability performance higher than 50 % of sustainability ratings within the same industry, whilst companies with a rating of C+ to D- have a sustainability performance lower or equal to 50 %. The same method is used for developing the variable *EnvRating*, which is based on the Refinitiv Environmental rating. The Environmental rating only considers the environmental criteria resource use, emissions and innovation, whilst excluding social and governance criteria.

The market controls include *Country* and *IssueDate*, to capture the potential effect of the issuer market, as well as the maturity of the market. An alternative robustness measure for *IssueDate* is *NSLBIssuers*, which measures the number of existing SLB issuers in the market at the time of the bond issuance. Furthermore, the company controls include *Revenue* and *EmployeeCount* as measures for the company's size, as well as an alternative robustness measure called *Revenue Group*, based on the fiscal year 2021 revenue, which includes more data points and allows to test for significant effects on the respective group size levels. Moreover, the analysis includes the company's *CreditRating* at the time of the bond issuance. For the variable *CreditRating*, the sample is divided into four credit rating groups, differentiating between Upper Investment Grade (AA to A-), Lower Investment Grade (BBB+ to BBB-), Speculative Grade (BB+ to CCC) and having no credit rating. Additionally, a company's sustainability experience in the form of earlier sustainable finance issuances, such as a green bond, is controlled for with the dummy variable *SFExperience*.

Finally, for the financial controls, the independent variables are the bond's *IssueSize*, *Maturity* and *Currency*. Moreover, the analysis additionally includes an alternative measure for issue size, with the variable *IssueSize Group* sorting the bond issuances into six different issuance groups. A detailed description of all independent variables can be found in Table 3. The subsequent analysis incorporates a company's industry and sustainability performance, as well as the eight defined market, company and financial criteria, which were outlined in section 3.2, 3.3 and 3.4. The ensuing probit regression analysis estimates whether the above defined independent variables have a significant effect on the probability to issue a SLB.

DOI https://doi.org/10.3790/vjh.92.3.91

Table 3: Overview of Variables

Variable	Description	Type	Unit
SLB	The issued bond has a SLB structure.	Quantitative	Binary (0 or 1)
Industry	An issuer's industry (BICS Level 1).	Qualitative	Categorical
ESGRating	The issuer's Refinitiv ESG rating group: Leader (A+ to B-); Laggard (C+ to D-); No Rating. The ESG rating at the time of the bond issuance is used for the variable.	Quantitative	Group (1-3)
EnvRating	The issuer's Refinitiv Environmental rating group: Leader (A+ to B-); Laggard (C+ to D-); No Rating. The Environmental rating at the time of the bond issuance is used for the variable.	Quantitative	Group (1-3)
Market Characteristics			
Country	An issuer's country of domicil (ISO Code).	Qualitative	Categorical
IssueDate	The bond's issuance quarter calculated based on the issuance date.	Quantitative	Quarters
NSLBIssuers	Number of SLB Issuers in the market at time of the bond issuance.	Quantitative	N. Issuers
Company Characteristics			
Revenue	The issuer's revenue during the fiscal year of the bond issuance.	Quantitative	USD millions
Revenue Group	The issuer's revenue during the fiscal year 2021 grouped according to size, revenues in USD millions (**1** ≤ 500 < **2** ≤ 1,000 < **3** ≤ 5,000 < **4** ≤ 10,000 < **5** ≤ 25,000 < **6** ≤ 50,000 < **7**)).	Quantitative	Group (1-7)
EmployeeCount	The issuer's employee count during the fiscal year of the bond issuance.	Quantiative	N. Employees
CreditRating	The issuer's credit rating group: Upper Investment Grade (AAA-A); Lower Investment Grade (BBB); Speculative Grade (BB-D); NR. The issuer's BB composite credit rating at the time of the bond issuance is used for the variable.	Quantitative	Group (1-4)
SFExperience	The issuer has issued a sustainable finance instrument before (dummy=1).	Quantitative	Binary (0 or 1)
Financial Characteristics			
IssueSize	The bond's issuance size.	Quantitative	USD millions
IssueSize Group	The bond's issue size group, issue sizes in USD millions (**1** ≤ 250 < **2** ≤ 500 < **3** ≤ 750 < **4** ≤ 1,000 < **5** ≤ 1,250 < **6**).	Quantitative	Group (1-6)
Currency	Bond issuance currency.	Qualitative	Categorical
Maturity	The bond's maturity size group, maturity in years (**1** ≤ 5Y < **2** ≤ 10Y < **3** ≤ 15Y < **4** ≤ 20Y < **5**; Perp.=**6**).	Quantitative	Group (1-6)

5 Results

5.1 SLB Market Attracts Carbon-Intensive Industries – But Not ESG Laggards

The first probit regression estimation (1) focuses on the companies' industry effect on the probability to issue a SLB, including the *Industry* variable with the low-carbon communication sector as a base level, as well as the respective market, company and financial characteristic controls. The results in Table 4 show that the carbon-intensive sectors materials and utilities have a significant positive effect on the probability to issue a SLB, as well as the consumer staples sector. The industry effect stays significant when adding the companies' relative sustainability performance to the regression (2 and 3), including the *ESGRating* variable with the ESG leaders as the base group, whilst dropping in Column 2 the insignificant control variable *Revenue* and in Column 3 the insignificant control variable *Currency*. Moreover, the results show that being an ESG laggard, as well as having no ESG rating, has a significant negative impact on the probability to issue a SLB. The same holds true when including the *EnvRating* instead (4).

Running the final two regression models (Table 4, Column 3 and 4) using a logit choice model to ensure the robustness of the test results confirms that both, industry and sustainability performance, have a significant effect on the probability to issue a SLB (see Hinsche and Klump 2023, Appendix, Table 5). Moreover, the Pearson goodness-of-fit test and a model specification test are both insignificant, supporting the chosen regression model (see Hinsche and Klump 2023, Appendix, Table 12).

Calculating the individual risk ratios based on the logistic regression coefficients, the results show that being a company from the carbon-intensive sectors materials (ß= 3.612) or utilities (ß=3.885) more than triples the probability to issue a SLB compared to a company from the low-carbon communication sector (see Hinsche and Klump 2023, Table 6). Moreover, companies that do not have an ESG rating have a 52 % decrease in the probability to issue a SLB, whilst companies considered as ESG laggards even have an 80 % decrease. The effect is only slightly smaller when using the Refinitiv Environmental rating, which focuses on the company's environmental performance, excluding social and governance criteria. Furthermore, the results show that Environmental laggards have a decrease of 75 % in the probability to issue a SLB. This emphasizes that the environmental criteria are in fact the driving force behind the ESG rating effect on the probability to issue a SLB.

DOI https://doi.org/10.3790/vjh.92.3.91

Table 4: Probit Regression Results – Industry and Sustainability Performance

	(1) SLB	(2) SLB	(3) SLB	(4) SLB
Industry Base: Communications				
Consumer Discretionary	.196	.081	.075	.065
	(.367)	(.332)	(.31)	(.314)
Consumer Staples	.68*	.715**	.714**	.656**
	(.389)	(.335)	(.328)	(.33)
Energy	.62	.51	.499	.465
	(.484)	(.401)	(.389)	(.389)
Health Care	.353	.218	.198	.191
	(.407)	(.361)	(.356)	(.354)
Industrials	.289	.336	.327	.279
	(.375)	(.339)	(.332)	(.332)
Materials	.662*	.798**	.789**	.767**
	(.369)	(.319)	(.312)	(.314)
Technology	-.171	.071	.038	-.013
	(.492)	(.411)	(.406)	(.406)
Utilities	.468	.88*	.875*	.843*
	(.432)	(.476)	(.473)	(.472)
ESGRating Base: ESG Leader				
ESG Laggard		-.822**	-.82**	
		(.375)	(.372)	
No ESG Rating		-.443***	-.444***	
		(.166)	(.169)	
Env.Rating Base: Env. Leader				
Env. Laggard				-.66**
				(.312)
No Env. Rating				-.456***
				(.169)
Country Control	Y***	Y***	Y***	Y***
IssueDate Control	Y***	Y***	Y***	Y***
Revenue Control	Y			
CreditRating Control	Y***	Y***	Y***	Y***
SF Experience Control	Y			
Currency Control	Y**	Y		
IssueSize Control	Y**	Y**	Y**	Y**
Maturity Control	Y***	Y**	Y*	Y**
Constant	-35.789***	-35.103***	-34.799***	-34.814***
	(8.475)	(4.335)	(4.217)	(4.22)
Clustered SE	Y	Y	Y	Y
Observations	1622	2122	2122	2122
Pseudo R^2	.221	.237	.23	.229
Log-Likelihood	-283.898	-397.403	-401.279	-401.905
Chi^2	116.133	177.048	167.078	167.608

Note. Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1. The regression estimations only include 1,622 observations in column 1, as 448 bond issuances do not have a reported company revenue during the bond issuance year and some observations are omitted due to perfect prediction. The regression estimations in column 2, 3 and 4 include 2,122 observations, because 16 conventional bond issuances do not report their issuance volume. Standard errors are clustered at the issuer level, as some companies have issued more than one SLB.

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Based on these findings, it can be said that the probability to issue a SLB is higher for some carbon-intensive industries. This is in line with the observation by the Climate Bonds Initiative (2023) that the SLB market includes an increasing number of issuances by carbon-intensive industries. The insignificant effect for the carbon-intensive energy and industrial sector (see Table 4) could be due to the fact that these sectors generally have a better availability of eligible green bond projects both in size and sustainability measures compared to other sectors. This is supported by the fact that renewable energy is the largest (35 %) use of proceeds category as of 2022 (CBI, 2022a), followed by buildings (27.1 %) and transport (18.1 %), which is the biggest industry group of the industrial sector according to the used BICS classification system. Consequently, the energy and industrial sectors are likely more indifferent between issuing a green bond or SLB compared to other industries, leading to an insignificant effect.

Regarding the companies' sustainability performance, ESG laggards and non-ESG-rated companies have a significantly lower probability to issue a SLB. The lower probability for non-ESG rated companies suggests that not having an ESG rating represents a barrier to the SLB market, even though the SLB instrument was designed in a way that companies can choose KPIs and SPTs independently of an ESG rating. One explanation could be that the SLB market values a company's sustainability awareness and experience, represented in the form of an existing ESG rating. In order to test for the potential effect of a company's sustainability experience and knowledge, the dummy variable *SFExperience* is included in the regression (see Table 8). As explained in section 4.4, the dummy variable represents whether a company has used any type of sustainable finance instrument before and has consequently acquired a certain level of sustainability experience and knowledge. However, the dummy variable is insignificant, indicating that the lack of sustainable finance experience does not constitute a barrier to enter the SLB market.

An alternative explanation could be that the SLB market interprets an ESG rating as a sustainability credibility tool and is thus leaning more towards companies that have an existing ESG rating. Furthermore, the results point out that the SLB market does not particularly attract ESG laggards, but rather that they have a very low probability to issue a SLB. This could be due to investors' greenwashing concerns and skepticism regarding SLB's transition effectiveness and credibility, which in turn leads to higher reservations towards companies that are lagging behind in their sustainability transition, the ESG laggards. Overall, the SLB market efficiently attracts carbon-intensive industries, but not ESG laggards. This observed market barrier is a clear area of concern and needs to be addressed with appropriate policies to ensure an efficient SLB market and thereby a successful sustainability transition of the real economy.

5.2 Influential Market, Company and Financial Characteristics

Taking a closer look at the variables for the market, company and financial characteristics (see Table 8), the issuer market and maturity of the SLB market both have a significant effect on the probability to issue a SLB. Firstly, the *Country* variable results show that Germany, France, Italy, Luxembourg, the Netherlands and Sweden have a significant negative impact on the probability to issue a SLB, compared to Austria. Secondly, the variable *IssueDate* has a significant positive effect on the probability to issue a SLB, emphasizing that as the SLB market becomes more mature, the probability to issue a SLB increases. Using an alternative measure for the SLB market maturity in the form of the variable *NSLBIssuers* supports this result (see Hinsche and Klump 2023, Appendix, Table 7).

DOI https://doi.org/10.3790/vjh.92.3.91

Table 8: Probit Regression Results – Market and Financial Characteristics
Probit Regression Results – Industry and Sustainability Performance

	(1) SLB	(2) SLB	(3) SLB	(4) SLB
Country Base: AU				
DE	-1.532***	-1.654***	-1.697***	-1.663***
	(.422)	(.436)	(.443)	(.437)
FR	-1.201***	-1.29***	-1.333***	-1.328***
	(.355)	(.355)	(.363)	(.358)
IT	-1.128***	-1.236***	-1.301***	-1.279***
	(.368)	(.386)	(.398)	(.392)
LU	-1.519***	-1.212***	-1.175***	-1.148***
	(.385)	(.37)	(.367)	(.363)
NL	-1.541***	-1.304***	-1.271***	-1.254***
	(.375)	(.38)	(.379)	(.379)
SE	-2.383***	-1.672***	-1.382***	-1.35***
	(.41)	(.436)	(.378)	(.374)
Issue Date	.138***	.135***	.134***	.134***
	(.035)	(.018)	(.017)	(.017)
Revenue	0			
	(0)			
CreditRating Base: Upper Investment Grade				
Lower Investment Grade	.805***	1.115***	1.139***	1.12***
	(.303)	(.326)	(.336)	(.332)
Speculative Grade	1.149***	1.492***	1.549***	1.542***
	(.327)	(.304)	(.31)	(.306)
No Rating	1.037***	1.298***	1.323***	1.332***
	(.299)	(.283)	(.285)	(.284)
SF Experience	.183			
	(.238)			
Currency Base: EUR				
GBP	.235	.222		
	(.408)	(.318)		
JPY	1.197	.835		
	(.765)	(.755)		
NOK		.813		
		(.615)		
SEK	1.076***	.472		
	(.246)	(.336)		
USD	.189	.245		
	(.203)	(.193)		
Issue Size	0**	0**	0**	0**
	(0)	(0)	(0)	(0)
Maturity Base: <5Years				
5Y < M < 10Y	.539***	.261**	.232*	.241**
	(.155)	(.128)	(.122)	(.121)
10Y< M < 15Y	.597***	.219	.16	.168
	(.22)	(.201)	(.208)	(.206)
15Y < M < 20Y	.206	.108	.062	.071
	(.505)	(.324)	(.326)	(.325)
20Y < M		-.43***	-.396*	-.384*
		(.167)	(.203)	(.213)
Perpetual	-.259	-.587	-.648	-.611
	(.426)	(.432)	(.445)	(.435)
Constant	-35.789***	-35.103***	-34.799***	-34.814***
	(8.475)	(4.335)	(4.217)	(4.22)
Clustered SE	Y	Y	Y	Y
Observations	1622	2122	2122	2122
Pseudo R^2	.221	.237	.23	.229
Log-Likelihood	-283.898	-397.403	-401.279	-401.905
Chi^2	116.133	177.048	167.078	167.608

Note. Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1. The regression estimations only include 1,622 observations in column 1, as 448 bond issuances do not have a reported company revenue during the bond issuance year and some observations are omitted due to perfect prediction. The regression estimations in column 2, 3 and 4 include 2,122 observations, because 16 conventional bond issuances do not report their issuance volume. Standard errors are clustered at the issuer level, as some companies have issued more than one SLB.

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In regard to the company characteristics, a company's revenue and sustainable finance experience both do not have a significant effect and are thus only included in the first regression (Table 8, Column 1). Moreover, using the variable *EmployeeCount* as an alternative measure for a company's size does not find a significant effect on the probability to issue a SLB (see Hinsche and Klump 2023, Appendix, Table 7). As the data availability for a company's revenue and employee count for the issuance year 2022 is still limited at the time of this research, an additional variable called *Revenue Group* is included to test for a company's size effect. This variable uses the companies' fiscal year 2021 revenue, which allows for more data points to be included. However, the company size effect on the probability to issue a SLB stays insignificant (see Hinsche and Klump 2023, Appendix, Table 7). In contrast, the issuer's credit rating at the time of the bond issuance has a significant positive impact on the probability to issue a SLB (Table 8).

Regarding the three financial characteristics, the bond's currency has a significant impact on the probability to issue a SLB in the first regression, but the effect turns insignificant in the second regression and the variable is thus subsequently excluded (Table 8, Column 1 and 2). Moreover, the bond's issue size coefficient is significant but indicates a very small positive effect (see Table 8). Finally, the bond's maturity has a significant positive impact on the probability to issue a SLB. The significance of the market, company and financial characteristics is tested by running the regressions using a logit choice model (see Hinsche and Klump 2023, Appendix, Table 9). The significance of the market, company and financial characteristics variables is confirmed and the respective risk ratios are estimated based on the logit regression coefficients.

Firstly, looking at the issuer market, companies from all included countries are less likely to issue a SLB compared to the base country Austria. The highest decrease (92 %) in the probability to issue a SLB is found for companies that are domiciled in Germany (see Hinsche and Klump 2023, Table 10). A possible explanation could be the density of sustainable finance policies in the respective countries. However, Steffen (2021) shows that France has the highest number of green financial policies, followed with a wide gap by Germany, the Netherlands and Italy. A potential explanation for the high density of SLBs in Austria, which were all issued starting September 2020, could be the political announcement, as part of Austria's government program for 2020–2024, to exempt sustainable investments from the capital gains tax (Bundeskanzleramt 2020). In anticipation of a subsequently higher investor demand for sustainable investments, companies had a higher incentive to issue a SLB. Nevertheless, all countries demonstrate a similar probability to issue a SLB compared to Austria. This indicates that even though the regional sustainable finance policy density might differ, European regulations are the higher-level policies and successfully set a uniform environment for sustainable finance to thrive.

Secondly, the market maturity results demonstrate that with every quarter that the SLB market grows and matures, the probability to issue a SLB increases by 24 % (see Hinsche and Klump 2023, Table 10). This can be seen as an opportunity, because with a more mature SLB market, transparency and SLB mechanisms should improve, thereby decreasing greenwashing as well as credibility concerns and as a result attracting more SLB issuers.

Thirdly, in order to take a closer look at a bond's issue size effect on the probability to issue a SLB, the categorical variable *IssueSize Group* is used (see Hinsche and Klump 2023, Appendix, Table 7). The probit regression results show a significant positive impact for bonds with an issue size larger than $1,250 million. Calculating the risk ratios accordingly, the probability to issue a SLB almost triples (ß=2.972, SE=1.428) if the bond has an issue size larger than $1,250 million, compared to the

base issue size smaller than $250 million. This finding implies that the SLB market currently attracts primarily issuers with larger financing needs.

Fourthly, the estimated risk ratio results for a bond's maturity show that bond issuances with a maturity between five to ten years increase the probability to issue a SLB by 45 % (see Hinsche and Klump 2023, Table 10). A possible explanation could be that the time frame for the first SPT assessments tends to be around five to ten years, often 2025 and 2030. Only on rare occasions do companies already set SPTs to, for example, be climate neutral by 2050. This result implies that the SLB market favors short-term targets, which promise short-term transition results, and is likely driven by investors' concern regarding the materiality and ambitiousness of the SLB's sustainability targets. A short-term target allows for a better assessment of whether the chosen KPI's are material to a company's current economic activities and the set SPTs are ambitious enough to ensure a real transition impact. This finding does not necessarily have to be a barrier, but it is an important realization, especially for ESG laggards, which initially might consider setting long-term targets for their transition. Instead, the SLB market analysis suggests that they should set credible and ambitious short-term targets in line with a long-term transition path.

Finally, a company's credit rating at the time of issuance also has a highly significant effect. Companies with a lower investment grade (ß=8.698) are more likely to issue a SLB than companies with an upper investment grade. The effect is similar in size for companies with no credit rating (ß=11.106) and more than twice as big for companies with a speculative credit rating grade (ß=16.732). These findings demonstrate that the SLB market does not consider a lower credit rating as a hindrance. Instead, companies might use a sustainability-linked structure to increase the attractiveness of their financing instrument, compared to competitors with a better credit rating and a conventional bond issuance. This is a convincing argument and opportunity for the SLB market to attract more companies to issue a SLB.

6 Discussion and Conclusions

In order to ensure a successful sustainability transition of our real economy and thereby achieve our climate goals, the European Green Deal Investment Plan has introduced several extensive sustainability legislations. The financial sector is a key channel to implement these regulatory requirements with the aim to push companies towards transitioning and to advance the economy's overall sustainability transition. Consequently, the capital market has developed an instrument to incentivize companies to align their activities with the two-degree climate path and to actively manage their climate risks: the sustainability-linked bond. The SLB incorporates a company-level sustainability perspective, encourages the issuer to set ambitious sustainability targets and incentivizes their achievement by demanding a payment in the case of failure to reach these goals. With the opportunity to communicate their transition strategy and a potential premium for SLB issuers, the instrument has gained a lot of attention leading to a rapidly increasing SLB market. But does the SLB market efficiently attract those companies that are most crucial for a successful sustainability transition?

In order to ensure a successful sustainability transition of the real economy, the SLB market needs to address those companies that are most crucial for advancing the economy's transition, namely carbon-intensive industries and ESG laggards. By analyzing the efficiency of the SLB market in ensuring the accessibility and market structures for potential SLB issuers, with a particular con-

DOI https://doi.org/10.3790/vjh.92.3.91

sideration for carbon-intensive ESG laggards, this paper makes two important contributions to the existing SLB literature, which has so far been mainly focused on the functionality and pricing of sustainability-linked instruments.

Firstly, this paper shows that the SLB market does efficiently attract companies from carbon-intensive industries, but that those companies are predominantly ESG leaders. Companies without an ESG rating and ESG laggards have a significantly lower probability to issue a SLB, demonstrating a SLB market entry barrier for companies with a lower or nonexistent ESG rating. Consequently, the SLB market so far fails to attract a significant fraction of companies that are crucial for a successful sustainability transition. This result points out the need for sustainability policies, as well as sustainable finance market structures and instruments that are better adapted for ESG laggards.

Secondly, the paper identifies four success factors for the SLB market to improve the accessibility and credibility of the SLB market:

1) Any regulatory adaptations to better attract ESG laggards should be implemented through European policy adjustments rather than singular local customizations, as the European sustainability legislations have been successful in establishing a common sustainable finance investment environment among the different EU countries.

2) The findings demonstrate that with growing maturity, more companies will consider entering the SLB market. This potential needs to be seized by providing appropriate market structures that satisfy investors' expectations regarding transparency and credibility standards. Through improving transparency and market mechanism whilst growing, the SLB market can work on diminishing credibility and greenwashing concerns, thereby also creating a better environment for ESG laggards.

3) The SLB market's preference for short-term sustainability targets should encourage ESG laggards to focus on credible and ambitious short-term targets that are in line with a long-term transition pathway. Using a climate-aligned transition pathway when setting KPIs and SPTs is becoming more prominent and can assist in setting credible and ambitious sustainability targets.

4) A company's lower credit rating is not a hindrance, but rather an opportunity for the SLB market to address a large target group. Companies with a lower credit rating can use a sustainability-linked structure not only to finance and communicate their transition strategy, but also to increase the attractiveness of their financing instrument compared to competitors with a better credit rating, but conventional financing instrument.

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