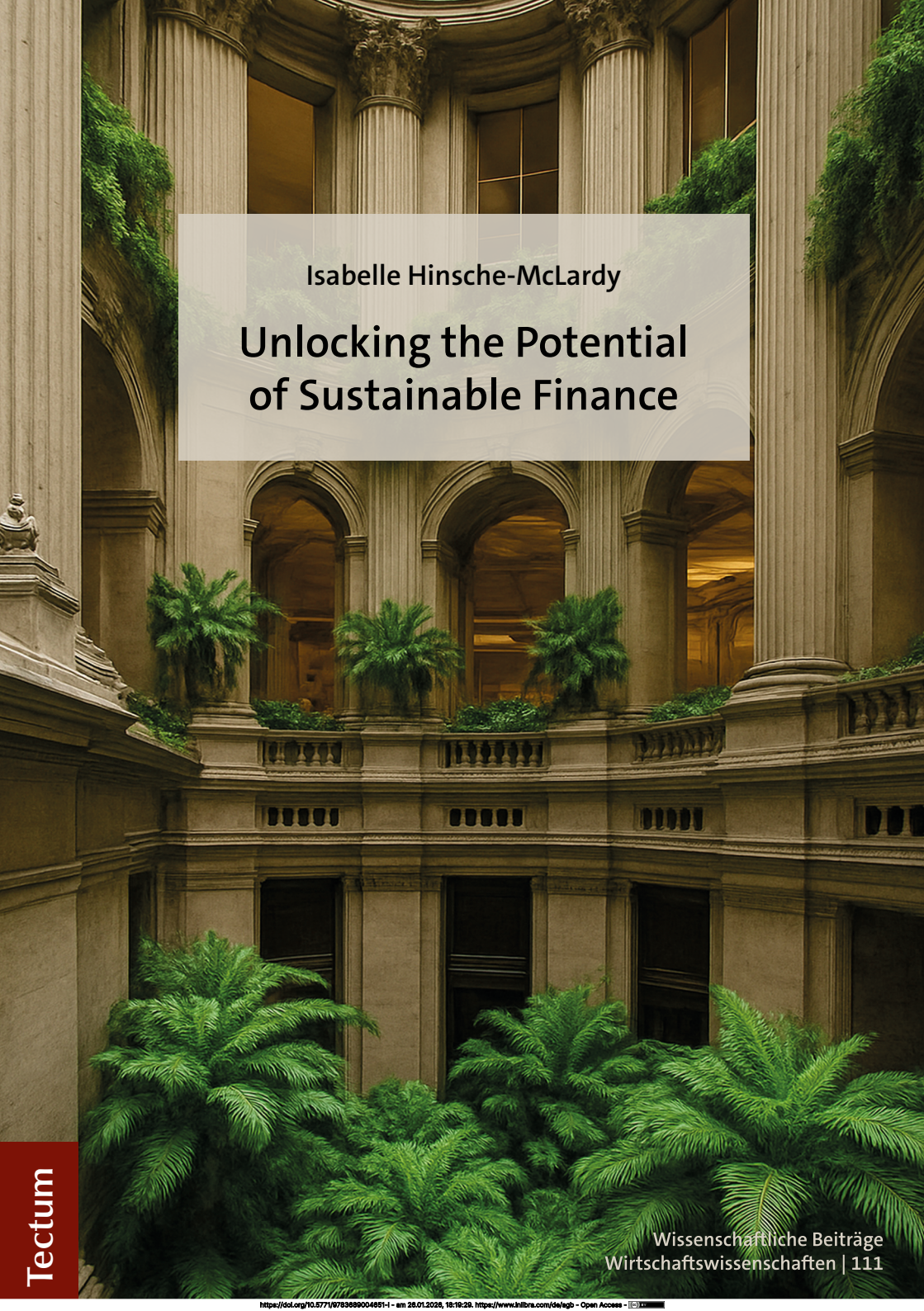

Isabelle Hinsche-McLardy

Unlocking the Potential of Sustainable Finance

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Summary of the Thesis

The severity and magnitude of the global climate crisis is becoming more apparent every year. The most recent Intergovernmental Panel on Climate Change (IPCC, 2023) report states that global warming might already reach 1.5°C in the near term, between 2030 and 2035, and that approximately 45 % of the world population live in an environment that is highly vulnerable to climate change (IPCC, 2023), which emphasizes the pressure to take action. In order to contribute to the global efforts against climate change, the European Union (EU) has adopted the European Green Deal in December 2019, with the aim to reach climate neutrality by 2050 (European Commission, 2024a). This also translated into country-level targets, for instance, Germany adopted the Climate Change Act in 2021 (Bundesregierung, 2021) determining that Germany is to achieve greenhouse gas neutrality already by 2045.

The market mechanisms of a social market economy, as in the EU, are insufficient to establish a systemic climate protection, as part of our current system, as long as environmental pollution does not have a price. This is reflected by the lack of private sector investments necessary for the transformation towards an ecologically sustainable economy (Georgieva & Adrian, 2022). The EU alone needs additional annual investments of up to €290 billion, to achieve its climate targets and thereby contribute to limiting global warming to 2°C (European Commission, 2019), whilst estimated necessary global annual investments reach up to $8.1 trillion (Buchner et al., 2023). Therefore, the state has to intervene by complementing the market process and market mechanisms for the transformation to an ecologically sustainable economy, which the EU intends to do with the EU Green Deal. In a market-oriented economy, the financial sector is responsible for providing the economy with liquidity in the form of financial resources. Consequently, the financial sector was chosen by politicians as a funda-

mental driving force for the implementation of sustainability disclosure regulations and acceleration of sustainability investments.

The financial sector is responsible for companies' financing and thereby offers an attractive channel to incentivize companies to become more sustainable. Moreover, financing frameworks, requirements and instruments allow for an adaptation to sustainability criteria. The process of incorporating sustainability criteria into investment and credit decisions has been termed sustainable finance and aims to support the achievement of the set sustainability targets (European Commission, 2024b). In order to successfully integrate sustainability criteria into financial decision-making, two main conditions have to be fulfilled:

Firstly, there has to be a common understanding regarding what relevant sustainability criteria are and they have to be provided by companies in the form of comparable measures. The European Commission introduced the EU taxonomy, to establish a common definition of sustainability and sustainability metrics (European Commission, 2024c). Furthermore, sustainability disclosure regulations such as the corporate social responsibility directive (CSRD) and the sustainable finance disclosure regulation (SFDR) make the reporting of sustainability criteria mandatory for companies and financial institutions, creating the desired sustainability performance transparency (European Commission, 2024d; European Commission, 2024e).

Secondly, authorities have to determine how sustainability criteria should be integrated into the existing decision-making and risk-assessment methods. On the EU level, the European Central Bank (ECB, 2022) published a guideline on climate-related and environmental risk integration and expects banks to comply with it by the end of 2024. On the national level, for example in Germany, the Federal Financial Supervisory Authority (BaFin, 2023) published binding recommendations on how to integrate ESG risks into risk management practices for banks. So far, regulatory risk adjustments are focused on pillar II and pillar III of the Basel framework, whilst the integration of sustainability risk criteria into pillar I, which calculates banks' capital requirements based on banks' risk, is still being discussed (Deutsche Bundesbank,

2023). As long as the existence of a risk differential between green and non-green assets is not proven, the European Banking Authority (EBA, 2023) recommends to incorporate sustainability risks into established pillar I risk categories, but currently refrains from supporting the introduction of risk-weighted adjustment factors, such as a green supporting factor.

Sustainability criteria are increasingly also integrated into established financial instruments directly. The most prominent examples are green (use-of-proceeds) or sustainability-linked bonds. Additionally to the characteristics of a conventional bond, these instruments can restrict the use of proceeds to green investment projects or link bond characteristics to sustainability criteria on the company-level (Hinsche, 2021). Sustainable finance structures can also be applied to other financial instruments, such as schuldscheindarlehen and loans, which are overall termed sustainable finance instruments (SFIs). Their aim is to strengthen sustainability investments and encourage the achievement of company-level sustainability targets.

Regarding the progress of integrating sustainability criteria into investment and credit decisions, the EU taxonomy is still being further developed and sustainability disclosure regulations have become binding since January 2024 (European Commission 2024c; European Commission 2024d). Thus, sustainability transparency is being established, but will need time to reach full scale. Furthermore, as the existence of a risk differential between green and non-green assets is still being debated in practice and science, no financial consequences in the form of green supporting or brown penalizing factors have been introduced yet (EBA, 2023). Instead, companies are currently primarily incentivized and guided, in the form of establishing sustainability targets and reporting frameworks, to invest into their sustainability transition by the use of SFIs and their potential benefits.

Consequently, expectations are very high regarding SFIs' potential to effectively incentivize companies to invest into their sustainability transition and thereby achieve the set sustainability targets. The most recent IPCC (2023) report findings underline that sustainability in-

vestments cannot wait until the desired sustainability transparency is achieved and more binding risk regulations based on the established sustainability transparency are introduced, but need to be implemented now. In order to raise the necessary sustainability investments, the full potential of sustainable finance has to be unlocked. This dissertation aims to provide a piece of the key to the solution and thereby support the efforts to increase sustainability investments and to ultimately reach the global climate targets.

In order to unlock the potential of sustainable finance, two overarching questions have to be answered. Firstly, whether SFIs work well in terms of generating the necessary sustainability investments and secondly, how the financial sector can support this process. This dissertation contributes to these research questions by analyzing the effectiveness of the sustainable finance market in regard to incentivizing companies to transition and by taking a closer look at the potential of the company-bank relation in the context of SFI use. The first research paper evaluates the effectiveness of the sustainability-linked bond (SLB) market in attracting those companies that are crucial for a successful sustainability transition, namely carbon-intensive companies and companies that are lagging behind in their sustainability transition. The second research paper investigates how banks can improve and tailor their SFI support to their customers, and the third research paper analyzes how SFIs and the incentive structure need to be adapted to small and medium-sized companies (SMEs) and companies relying on bank-based financing.

The first paper offers important insights into the SLB market, which offers a promising approach to incentivize companies to implement their transition strategy and is growing rapidly. Sustainability-linked instruments require companies to set company-level sustainability targets and implement a financial consequence, for example in the form of a coupon step-up, should the company fail to achieve its set sustainability targets. Thereby, companies are encouraged to develop a credible transition strategy with a transparent reporting mechanism, as well as to ensure the achievement of their transition strategy. From a company

perspective, sustainability-linked instruments offer the opportunity to transparently communicate their transition strategy and a potential pricing advantage, so-called premium, compared to a conventional financing instrument. Consequently, sustainability-linked instruments are a promising SFI. *But does the SLB market efficiently attract companies that are crucial for a successful sustainability transition, namely companies that are carbon-intensive and are lagging behind in their sustainability transition, thereby promising the largest emission reduction potential?*

In order to assess the SLB markets' mechanism and accessibility, the paper develops a conceptual framework and analyzes companies' probability to issue a SLB by running probit and logit regressions based on the framework and subsequently calculating the respective risk ratios. The research results demonstrate that the SLB market indeed attracts carbon-intensive industries, but fails to attract companies that are lagging behind in their sustainability transition, termed ESG laggards. In fact, ESG laggards and companies without an ESG rating have a significantly lower probability to issue a SLB. This indicates a SLB market entry barrier for companies that are lagging behind in their sustainability transition, likely caused by the fact that they are faced with extensive data collection and reporting requirements, which are costly to implement and can prevent them from entering the SLB market. However, it would be especially important that those companies start to transition.

In fact, SLBs offer an attractive opportunity for companies that are carbon-intensive and companies that are lagging behind in their sustainability transition to transparently communicate their transition strategy, which becomes increasingly important in terms of financing access and financing conditions. Furthermore, the results suggest that a sustainability-linked structure can be particularly beneficial for companies that have a low credit rating, as it can improve a financial instrument's attractiveness compared to a conventional instrument with a higher credit rating.

Nevertheless, the research results demonstrate that the SLB market must not only improve its accessibility, but also its transparency and credibility. Greenwashing and credibility concerns are currently among the biggest barriers to SLB use. The results indicate that companies should start with short-term sustainability targets, in line with a long-term transition plan, rather than directly setting long-term climate-neutrality target claims. This could also help lower the entry barrier for companies lagging behind in their sustainability transition, as setting and reaching short-term sustainability targets could appear more feasible to them.

Despite the identified challenges, the results confirm the SLB market's growth potential. Furthermore, the paper finds that the EU legislations have successfully established a common sustainability investment environment and the paper therefore recommends that any adjustments regarding the accessibility and transparency of SLBs should be implemented on the EU level rather than the country level. Overall, the results contribute to the literature on sustainability-linked instruments, which has so far been primarily focused on pricing, by focusing on the effectiveness of the market, incentivization and implementation mechanisms.

The second research paper complements the findings of the first paper that SFI use and needs might differ for companies based on their sustainability transition progress. In fact, sustainability regulations apply to companies depending on their company size and whether the company is listed. Moreover, the increase in transparency regarding companies' sustainability performance can have different effects on their financing, depending on the company's industry, as for instance carbon-intensive industries are more often subject to divestment and exclusion criteria. Based on these observations, banks should provide more tailored sustainable finance support in line with companies' individual sustainable finance needs. *But how do companies differ in their sustainable finance interests and needs, and how can banks provide tailored sustainable finance support to their credit customers accordingly?*

The research question is answered by applying a mixed method approach, using regression and thematic content analysis, as well as by conducting a survey with 700 corporate customers of a large German bank. Based on the recorded observations, the research paper identifies and analyzes seven push and pull factors, as well as barriers to SFI use, in regard to differences between company sizes, sectors and capital market activity. The research results demonstrate that SFI use indeed significantly differs between company sizes, sectors and capital market activity. Furthermore, the analysis indicates significant differences in companies' SFI interests and needs particularly with respect to company sizes, emphasizing that banks should tailor their sustainable finance support accordingly.

In fact, smaller companies demonstrate a lower awareness and knowledge regarding how sustainability regulations and transparency can affect their financing access and conditions, as well as how SFIs work and how they can be beneficial. Moreover, in regard to SFI use barriers, smaller companies state predominantly insufficient consulting and the applicability of SFIs. Both observations indicate that smaller companies might need a more fundamental consultation than larger companies, supporting a more tailored sustainable finance support.

Additionally, the research paper shows that companies in general, irrespective of size, sector and capital market activity, experience regulatory and transformative pressure, but are not sufficiently aware of how this can impact their financing access and conditions. The qualitative evaluation supports this observation, as companies demand more information regarding SFI use from their banks, as well as clear expectations how sustainability performance measures might affect their financing access and conditions.

In regard to SFI barriers, companies predominantly report bureaucracy, lack of sustainability data and choice of sustainability targets. In order to overcome these barriers they would like to receive best practice examples from their financing partners and see their bank as a sparring partner that supports them in financing their sustainability transition. Furthermore, the analysis results demonstrate the need for

a more simplified and standardized SFI process, but also show that proactively suggesting SFI use can be a first step to increase SFI use. Overall, this research paper contributes to the literature on companies' SFI use and behavior by identifying companies' individual sustainable finance interests and needs, as well as by formulating three recommendations on how banks can advance and support SFI use by tailoring their sustainable finance support to smaller companies accordingly, improving sustainable finance awareness and knowledge, and simplifying the implementation of SFIs.

The third research paper adds to the findings of the second research paper, that companies differ significantly in their SFI needs and interests, by taking a closer look at companies that rely on bank-based financing. Companies that are not active in capital markets are not exposed to the same sustainability regulations and market environments as companies active in capital markets. This could influence how they can be successfully incentivized to use SFIs. Furthermore, in Germany's bank-based financial system, companies that rely on bank-based financing predominantly have a house bank relation, which can be defined as a long-term, close relation with a bank that provides all core financial services (Behr & Schmidt, 2016; Hackethal, 2004). The characteristics of a house bank relation can also influence whether and how companies use SFIs. Consequently, this research paper analyzes *whether and how the currently implemented sustainable finance incentivization scheme might need to be adapted for companies not active in capital markets and how the characteristics of a house bank relation can be utilized for an efficient SFI use.* Both evaluations are performed with a special consideration of SMEs not active in capital markets.

The research paper applies a mixed method approach, using logistic regression and thematic content analysis, and uses the same database, collected through a survey with 700 corporate customers of a large German bank, as the second research paper. The results confirm that companies not active in capital markets have a significantly lower share of SFI users. Furthermore, companies not active in capital markets differ in regard to their motivational, implementation and enabling

factors to use SFIs, compared to companies active in capital markets. In fact, companies that rely solely on bank-based financing perceive a lower regulatory pressure and transition risk. Moreover, compared to companies active in capital markets, they cannot benefit from reputational advantages resulting from SFI use in capital markets, in the same manner. Consequently, the research results indicate that companies not active in capital markets can be predominantly incentivized to use SFIs through a pricing advantage.

Green and sustainability-linked loans can potentially offer such a pricing advantage, in the form of a premium, but also have precise and binding sustainability data and reporting requirements. The research results show that this poses a challenge to companies not active in capital markets, as they report insufficient data availability and monitoring, as well as a lack of sustainable finance knowledge and experience as barriers to SFI use. This observation suggests that SFIs should be adapted for companies not active in capital markets, and particularly SMEs not active in capital markets, taking their current level of data availability into consideration. Based on the research results, a form of SFIs that could be an, at least temporary, efficient alternative for companies not active in capital markets, that are currently unable to meet sustainability data requirements of sustainability-linked or green loans, could be promotional loans. They foster investments into companies' sustainability transition, offering a clear pricing or risk advantage compared to conventional instruments, but have lower sustainability data requirements.

Regardless of whether the intended instrument is a green, sustainability-linked or promotional loan, banks play a crucial role in advising and supporting companies in regard to their SFI use. However, the research results demonstrate that companies not active in capital markets experience a high uncertainty regarding their banks' role and potential support. Furthermore, the research paper shows a very low recommendation of SFI use by banks for companies not active in capital markets, and the effect is even stronger for SMEs not active in capital markets. The analysis indicates that banks are not making sufficient use of their

long-term relations with their corporate customers, including benefits such as an in-depth knowledge of companies' business and an established trust, which could be used to foster investments into companies' sustainability transition. Consequently, the paper emphasizes the importance of banks, and particularly regional banks, to advance and improve their sustainable finance support.

Overall, the third research paper contributes to the current literature on sustainable finance in bank-based financial systems by identifying how companies not active in capital markets differ in their motivational, implementational and enabling factors to use SFIs, as well as by formulating recommendations on how SFIs can be adapted accordingly and how the benefits of house bank relations can be utilized.

This dissertation has developed three main calls for action, based on the findings of the three research papers, that can provide a piece of the key to unlock the full potential of sustainable finance and thereby contribute to the overarching goal of mobilizing the necessary sustainability investments.

Firstly, sustainability disclosure regulations are necessary to create a common basis for comparable sustainability performance measures. However, they should not paralyze companies in regard to their sustainability transition. The risk of a potential adverse effect is imminent and particularly in regard to SMEs should be evaluated carefully.

Secondly, it is crucial to recognize companies' individual sustainable finance interests and needs, and to adapt SFI requirements and structure accordingly. SFIs need to be able to grow in terms of their binding requirements and structures in line with companies' data availability and reporting progress.

Thirdly, existing and established structures, such as long-term house bank relations and their benefits, have to be leveraged to foster sustainability transition investments. The financial sector should not be reduced to implementing sustainability disclosure regulations, but given the room to utilize its established infrastructure to support an efficient and effective SFI use.

The research and findings of this dissertation are equally relevant for banks, companies and politics. For policy makers, as they emphasize the need for sustainable finance instruments and regulations that are more adapted to companies' level of sustainability data availability and reporting. This is particularly important for companies relying on bank-based financing and SMEs. Furthermore, the results demonstrate that promotional loans can be an, at least temporary, efficient instrument to foster sustainability transition investments for those companies. However, the findings also emphasize the need for determining a price for environmental pollution and in this context the introduction of, for instance, risk-weighted adjustment factors to capital requirements, in order to ensure an effective SFI, whilst returning to market-based structures.

Regarding the relevance for companies, the research results demonstrate that they need to improve their sustainable finance awareness and knowledge, as well as that they still need to catch up in terms of the required sustainability data collection and monitoring. Finally, the results of this dissertation are especially relevant for the financial sector, in particular banks, as they point out that banks need to improve their sustainable finance support in terms of consultation, actively advising companies on SFI use, and becoming a sparring partner for companies in their pursuit to finance their sustainability transition.

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