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Bachelor's Thesis

How can European banks strategically strengthen their sustainable lending ecosystem?

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Abstract

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This thesis investigates the research question how European banks can strategically strengthen their sustainable lending ecosystem. The climate crisis along with other megatrends have shaped the financial industry significantly and the fast growth of sustainable finance provides both opportunities and threats to the traditional banking business model. To investigate how banks can strategically position themselves this study examines specialties around the sustainability-linked loan. By means of a driving forces analysis, the most important action fields for strategic decision-making for banks regarding the sustainability-linked loan have been identified. The analysis of those action fields shows that banks should aim to use the current momentum in sustainable finance and position themselves as pioneers to gain competitive advantage. The research further showed that there is an incentive for banks to use greenwashing methods regarding the sustainability-linked loan. To prevent greenwashing allegations, it is necessary to introduce sensible and standardized ESG-frameworks and key performance indicators early on along with preparing for future developments in the area of regulation.

Keywords: Sustainable finance, green finance, sustainability-linked loans, European banks, sustainability stragey

Contents

Glossary

APLMA	Asian Pacific Loan Market Association
CSR	Corporate social responsibility
EAD	Exposure at default
EL	Expected loss
ESG	Environmental, social, governance
GL	Green loan
GHG	Greenhouse gas
LGD	Loss given default
LMA	Loan Market Association
KPI	Key performance indicator
PD	Probability of default
SLL	Sustainability-linked loan
SME	Small and medium enterprises
UN SDG	United Nation Sustainable Development Goals

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1 Introduction

1.1 Background and justification of the research

Climate change is currently the biggest threat and challenge for humanity. Political agreements and new policies like the United Nation Sustainability Development Goals (UN SDG), the Paris Climate Agreement and the EU Taxonomy set a political frame for the so-called green transition. This transition includes a transformation of the energy sector as well as massive investments in infrastructure which supports the overall objective of keeping global warming below 2°C. According to Zhang, the costs of transforming the energy sector will amount to $53 trillion by the year 2053. (Zhang, et al., 2019) The required investments need to be financed which is why banks and other financial institutions and the extent to which sustainable and green policies are part of their business model become increasingly important. (Marois, 2017) Therefore, increasing pressure from various stakeholders like private customers and political institutions has led to a rising importance of sustainability in the finance sector. To transform economic sectors which impact the environment in a harmful way, sustainability-linked lending provides funds for either especially environmentally friendly projects or incentivises borrowers to improve their sustainability performance.

1.2 Research question

This research aims at giving European banks strategic recommendations regarding the strengthening of the sustainable lending. In the first part, special attention will be paid to so-called sustainability-linked loans to understand the specialties that come with those loans as well as trends in the area of sustainability-linked loans. Furthermore, this paper tries to investigate differences between conventional loans and sustainability-linked loans concerning the borrower’s special obligations and lender’s risk. Another focus will be on the investigation of motivation of both borrowers and lenders to

contract a sustainability-linked loan. In the second part, an analysis of the driving forces which are currently and in the long-run shaping and influencing the sustainable lending industry aims at identifying strategic proposals for banks to strengthen their sustainable lending system.

1.3 Research methodology and structure of the thesis

The structure of the thesis is as follows: Chapters 2.1 to 2.3 provide the theoretical background for the later driving forces analysis and aim at introducing the reader to the topic of sustainability-linked loans as well as giving definitions for concepts used in this work. Therefore chapter 2.1 presents a literature review with broad review of green finance and its latest development as well as policy background for the reader to understand the historical background and current political framework in which sustainability-linked loans are situated. In chapter 2.2, an overview of sustainability-linked financial products and a synopsis of green and sustainability-linked loans is given with the goal of a clear distinction and definition of sustainability-linked loans. Furthermore, a brief market analyses of the green and sustainability-linked loan market sets a foundation for the later driving forces analyses. Chapter 2.3 defines the concepts of borrowers and lenders which are used throughout the whole thesis. Chapters 2.4 to 2.6 provide a more detailed analysis of the structure of sustainability-linked loans. A technical understanding of the borrowers' special obligations which arise from contracting such a loan (chapter 2.4) along with an analysis of the relation of credit risk and sustainability (chapter 2.5) are needed for the following analysis of both lenders' and borrowers' motivation to contract a sustainability-linked loan as well as setting a foundation for the driving forces analysis and the resulting strategic proposals.

To be able to give strategic recommendations for banks, chapter 3 attempts to shift from the previous microeconomic perspective to a more macroeconomic approach by providing an industry analysis of the sustainable lending industry. Based on a PESTLE analysis, the following driving forces analysis identifies the most important forces and ranks them according to their importance and

uncertainty. The driving forces with the highest strategic importance as well as uncertainty are further analysed regarding their impact on the overall industry attractiveness. Based on this, chapter 4 gives a conclusion and strategic recommendations for a few selected driving forces. Furthermore, limitations of the research and further opportunities for research are demonstrated. Chapter 5 concludes the study by providing a detailed bibliography.

2 Literature review

2.1 Green and sustainable finance and latest developments

One main issue is that there is still no universally valid definition of green or sustainable finance. This problem is two-fold as it raises the question which economic sectors and activities can be considered green and at the same time there is no global consensus as to which criteria a financial product needs to fulfil to be considered green or sustainable. (Berrou, et al., 2019) According to Berrou, green finance can be considered “the global financial community’s first structured attempt to join financial performances and positive environmental impact and can be seen as one of the concrete signs of the economic system’s adaptation to the global environmental challenge”. (Berrou, et al., 2019) This stems from the hypothesis, that capitalism as our world’s current dominating economic system does not incorporate environmental protection and preservation as a natural “limit”. The Swiss Federal Ministry of Environment defines sustainable finance “as financial products and services, under the consideration of environmental, social and governance factors throughout the whole risk management and decision-making process, provided to promote responsible investments which create a positive environmental, social and governance impact.” (United Nations Environment Programme (UNEP), 2016)

The literature review showed that it is difficult to make a clear distinction between the green finance and sustainable finance and the terms are often used interchangeably. To reduce the complexity of this problem for this study, a definition of the European Parliament will be used according to which

“sustainable finance is an evolution of green finance” (Spinaci, 2021) meaning that more than just environmental issues are addressed by focusing further on social and governance issues and risks.

Based on this definition of sustainable finance and the focus of this research on sustainability-linked loans, this chapter provides a brief overview of the history and recent developments of not only sustainable but also green finance to give the reader an impression on how sustainable lending practices evolved from rather project-based, green finance.

To understand current conceptual issues, developments and trends, and future research directions in green finance, Zhang et al. analysed 381 papers, using a bibliometric approach, in 2019. In doing so, the researchers found that the numbers of publications, which generally tend to increase every year, increased especially strongly since 2015 which brought them to the conclusion that specifically the Paris climate agreement of this year led to an amplified interest of academic researchers in the topics of green, climate and, carbon finance. The examination of journal distribution has shown that a vast majority of the journals focused on environmental as well as climate change which led Zhang to the conclusion that the topics of green, climate, and carbon finance were not yet part of mainstream economics and finance publications. The analysis of countries of origin of the authors has shown that most of the publications originated in the US and Europe, and few other developed countries. The high number of publications from the US is according to Zhang due to the location of important institutions like the UN and the World bank in the US. Furthermore, Europe has been an influential promoter of climate policies like the Paris climate agreement or taxonomies, which leads to a higher interest of scientific researchers in the EU. The emerging countries which contributed most were China and India. Zhang points out the importance to engage developing countries in the discussion around green finance, as they take responsibility for a significant share of greenhouse gas emissions. To reach global agreement about climate and finance policies, the specific issues of developing countries should be the focus of future research. The keyword analysis has revealed the

high importance of the topics “climate finance”, “climate change", and “policy”. The lack of economic or financial topics in the top ten of keywords may indicate once again the lack of contributions from financial and economic researchers and journals. The results of Zhang’s bibliometric analysis are a confirmation of the importance of the research question as the author clearly points out that contributions from the economic and strategic perspective are desirable since a pure discussion from neither policy nor environment side is sufficient for the practical implementation of green finance policies. (Zhang, et al., 2019)

As the research question will be focused especially on the emergence of sustainable bank lending, it is fundamental to understand the origin of it as well as motivation, recent developments, and future trends in green and sustainable banking and finance. When looking at the development of green finance over the last decades, a distinction into different phases can be made which mark a point when green finance was mainly about pure risk-management, following a rising awareness for new business opportunities and finally a policy-driven emergence of entirely new markets.

The greening of the banking sector is no recent development, as it originated in rising energy prices and the introduction of new environmental laws in the 1980s. Especially for banks, the very first approach to becoming greener was therefore involuntary and due to external circumstances. Those circumstances created risks for banks, which are threefold. First, banks were and are determined to prevent the risk of damage in their reputation. Second, new environmental regulations lead to an increased risk of fines in case of violations. As especially businesses were assigned responsibility for their “greenness”, i.e. the impact of their operations on the environment, a risk was created for their lenders, which are mostly banks and other financial institutions. This led to the development of the so-called risk management, especially in commercial credit of banks. A shift in perception of risks and opportunities in green finance then caused banks to dig deeper into possible benefits arising from green financial products, which intensified bank’s assessment of green investment opportunities like mutual funds or indices. Based on this, banks were able to

widen their product portfolio. 2015 was a key year for the development of sustainable finance, as major global agreements and policies such as the Paris climate agreement drastically strengthened the significance of green and climate bonds regarding the financing of climate change mitigation. Until then, reporting was mainly focused on representing financial performance, however reporting about environmental and social impact was not mandatory and therefore done by using voluntary codes of conduct. As green finance managed to influence policy decisions worldwide, more and more countries additionally developed regulatory approaches like China's green credit policy or the EU Taxonomy. (Bai, et al., 2013)

Looking at the development of sustainable and green finance and its relevance in economic and financial research and publication, one can draw the conclusion that sustainable and green financial products are often still considered niche products and reporting seems to mostly focus on portraying a corporation as positive as possible with the intention on maintaining reputation. Hence reporting is focused on the investor's perspective with the main motivation of risk management. (Weber & ElAlfy, 2019) To meet the overall objective of a comprehensive transition of all economic sectors, sustainable and green finance must find its way out of this niche and into the mainstream of financial products. (Goglio & Catturani, 2019)

2.2 Sustainable financial products

The variety of green and sustainable financial products offered covers a wide range. When it comes to green financial products, Akomea-Frimpong found that the most relevant green financial products identified by banks included green loans (credit), green long-term investment account, carbon finance, climate finance funds, green traded stocks and bonds, green bancassurance and green infrastructural finance. (Akomea-Frimpong, et al., 2021) Sustainable financial products can for example include sustainable investment funds, sustainable insurance products, sustainable savings products, and sustainable credits or

loans. (Febelfin, 2012) As this research is centred around sustainable lending, particular focus will be on sustainable loans.

2.2.1 Definition and categorization of sustainable loans

Before further analysing specialties in sustainable loans, a definition of sustainable loans and a distinction into the different types of sustainable loans is necessary. This paper relies on the classification of sustainable loans according to the Loan Market Association (LMA). According to the LMA, sustainable loans can be categorized into green loans, social loans, and sustainability-linked loans. Social loans will not be part of this research as they do not have a focus on financing the green transition but have a special emphasis on people rather than the environment, financing so-called “social projects”. (Loan Market Association (LMA), 2021)

To provide a framework for green loans, the LMA together with the Asian Pacific Loan Market Association (APLMA) issued a voluntary guidance on green loan principles in 2018, defining them as “any type of loan instrument made available exclusively to finance or refinance, in whole or in part, new and/or existing eligible green projects [...] and are aligned with the four core components of the GLP”. (Loan Market Association (LMA), 2020)

One year later, the LMA and APLMA published the sustainability linked loan principles, defining sustainability linked loans as any “type[s] of loan instruments and/or contingent facilities (such as bonding lines, guarantee lines or letters of credit) which incentivise the borrower’s achievement of ambitious, predetermined sustainability performance objectives“. (Loan Market Association (LMA), 2021) Further, the LMA identifies five core elements which characterize a sustainability-linked loan and provide a framework for borrowers and lenders. The first element is the selection of certain key performance indicators (KPIs) and the second element is the calibration of sustainability performance targets (SPTs), both of which will be explained in chapter 2.4.2. The third element is called loan characteristics and constitutes the difference between green and sustainability-linked loans, namely that with the latter, the use of funds is not

fundamental, meaning that they can be used for overall corporate purposes. Instead, the borrower's performance on predefined SPTs is measured and the performance provides a basis for renegotiation of the interest margin. (Wilkinson, et al., 2021) The fourth element is about reporting, suggesting how often and in which way borrowers should report about their progress on the SPTs. The last core element explains the mandatory, external verification of the performance on the SPTs by monitoring the linked KPI.

2.2.2 The green and sustainability-linked loan market

Looking at the markets for sustainable and green loans, there is a lack of comprehensive research regarding its potential success, which is due to the fact the markets are still relatively young. Yet, there seems to be a consensus between economists about the huge financial potential in this young market, which is also reflected by its fast and exponential growth.

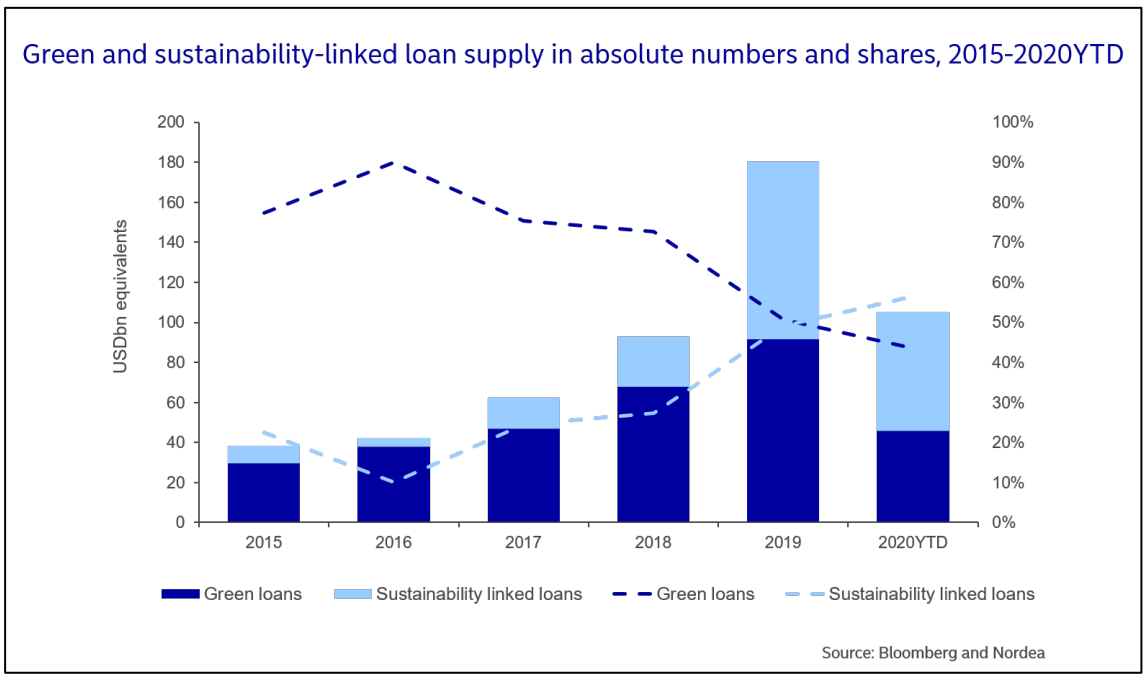

Figure 1: Sustainable loan market shares (Ramel & Michaelsen, 2020)

According to an analysis by Nordea and Bloomberg who investigated market shares during the years 2015 to 2020, the green loan market had an initial higher market share which decreased while the initial low market share of

sustainability-linked loans (SLL) increased. Finally, the SLL market share exceeded the green loan market share in 2019. (Ramel & Michaelsen, 2020) Research by the Bank of America showed that the total value of green loans (GL) issued in 2020 amounted at approximately 100 billion USD whereas the total issuance of sustainability linked loans amounted at almost 200 billion USD during the same year. (Wass, 2021)

According to Ramel, besides the increasing pressure from various stakeholders, this rise in SSL issued can also be explained by the publication of the Sustainable Loan Principles in 2019, as it helped lenders' and borrowers' orientation and increased legitimacy and credibility in the market. Furthermore, there is a positive correlation between the increase in green loans as well as green bonds and the increase in sustainability linked loans. This is due to the fact, that green bonds and green loans are competing for the same purpose of investment. As projects can only be financed through a green bond or loan once, sustainability linked loans have a competitive advantage since they need not specifically be used for one project but are related to the borrower's sustainability performance. This is also reflected in the distribution of sectors which are raising debt either through green or sustainability linked loans. While almost 90% of green loans are contracted amongst five sectors, the top five sectors for sustainability linked loans only amount for about 40%. This is due to the fact, that certain sectors like renewable energy are eligible for green loans by very nature while sustainability linked loans can be borrowed almost independently from the sector. This mechanism can ultimately support the greening of a variety of sectors which would under other circumstances not be able to qualify for a green loan. This is because those sectors are either considered very unsustainable or not clearly assessable in terms of their greenness. In this case, the sustainability-linked loan allows borrowers to obtain funding for transformation by providing clear goals on how sustainability improvement will be achieved and how progress is supposed to be tracked.

When it comes to the geographic distribution of the volume of sustainable and green loans issued during the years 2015 to 2020, sustainable loans are most

popular in in Europe and the Nordic regions. Ramel indicates that a potential reason for this might be the importance which sustainability has gained in current policymaking. Initiatives and new regulations like the EU Taxonomy based on the EU Green Deal and the EU Action Plan have influenced the loan market tremendously and increase pressure on banks to alter their product portfolio. (Ramel & Michaelsen, 2020) Even though the global COVID-19 pandemic slowed the growth due to the overall economic recession and corporation's need to solve short-term problems rather than focusing on long-term strategy, a survey of the Bank of America indicates an enormous growth in the SLL market. The study found that worldwide issuance in the first six months of 2021 amounted to 350BN USD, compared to an overall issuance of 197BN USD in 2020. (Wass, 2021) The overall growth potential of sustainability-linked debt seems to be promising, and it is currently the fastest growing segment of sustainable capital markets. Yet, there is need for further standardization, education of borrowers and strict regulations to uphold the credibility of sustainability-linked debt. (TD Securities, 2022)

2.3 Definitions

2.3.1 Definition of borrower

In the following analyses, the word borrower will be used for debtors of sustainability-linked loans. As this type of loan is usually an instrument of corporate financing, private citizens are not suited to take out such a loan. Therefore, borrowers in this study are characterized by being corporate entities in the broadest sense. Research showed, that so far mostly big corporations take out sustainability-linked loans, but they are equally well suitable for small and mediums enterprises.

2.3.2 Definition of lender

The term lender describes the creditor of sustainability-linked loans. As the research especially around policies and political frameworks was geographically focused on the European Union and due to the very nature of the research

question, lenders in this study are characterized as European commercial banks.

2.4 Analysis of borrower's obligations in sustainability-linked loans

Except for the Sustainability- Linked Loan Principles issued by the LMA, there is not yet a standard template or predefined structure for sustainability-linked loans, but certain trends can be observed. The following section gives an overview of certain elements as well as obligations which are usually part of or affect a loan agreement and describes the special technical features of those elements in sustainability-linked loans. In doing so, particular focus will be on loan covenants in general and the implementation of specific sustainability-related covenants in SLL agreements as well as the application of the so-called ESG margin ratchet, as those are essential for the sustainability-linked loan.

2.4.1 Definition of loan covenants and dynamic loan contracting

Covenants are not new and have for a long time been a part of the loan agreement which ensure that the borrower commits to a certain performance in terms of financial as well as non-financial key performance indicators. According to Fight, loan covenants help protect the lender against the credit risk of the borrower by an additional commitment. (Fight, 2004) This commitment can be done by means of affirmative loan covenants which state to which goals the borrower is bound by contract. Additionally, negative loan covenants allow further limitations by stating certain actions which the borrower will not undertake. Lastly, borrowers may also commit to reaching certain financial goals or aiming for predefined financial key performance indicators by agreeing to financial loan covenants. (CFI Education Inc, n.d.) Main reasons for which lenders might implement covenants into loan agreements are transparency and the possibility to track borrower's viability. Such performance agreements might include a limitation of further debt to be borrowed, changes made in strategy or management and various financial KPIs in the categories of liquidity, profitability, and leverage. (Sagner, 2009) Depending on the agreed upon

consequences in the loan agreement, lenders might react with a variety of consequences which can differ in how accommodating or strict they are. According to Fight, breaches of covenant agreement are always costly to the borrower and costs can be categorized into renegotiation costs for the agreement in distress as well as restructuring costs since operations need to be altered to successfully meet the covenant. Additionally, Fight identifies costs caused by increased lender control and refinancing cost, as lender's increase the interest rate of the loan in distress. (Fight, 2004) Freudenberg's analysis supports Fight's findings, stating that consequences of breaches of covenant agreements might include lenders to increase the loan spread, i.e. the loan will be more costly for the borrower. Furthermore, banks might implement even more covenants which leads to a "tougher financial structure". This is also true for subsequent loan agreements. (Freudenberg, et al., 2017) It is possible, that a breach of covenant results in default. In extreme cases, the lender might even decide to liquidate the borrower's collateral.

2.4.2 Loan covenants in sustainability-linked loans

In the case of sustainability-linked loans, the borrower's performance obligation and therefore the covenant agreement is usually linked to the so-called Sustainability Performance Targets (SPTs). Messini describes SPTs as part of the loan agreement which need to be discussed before the contract is signed. SPTs serve the purpose of showing how the individual business aims to improve its ESG-performance. Therefore, clear objectives should be agreed upon. To be able to track performance and progress on each SPT, KPIs need to be implemented. (Messini, et al., 2022)

Table 1: Selected examples of common categories of SPTs and exemplary improvements (Loan Market Association (LMA), 2021)

Sustainability Performance Target Category	**Example**
Environmental	
Circular economy	Increases in recycling rates or use of recycled raw materials / supplies. Achievement of zero waste in production plants.
Energy efficiency	Improvements in the energy efficiency rating of buildings and/or machinery owned or leased by the borrower.
Global ESG assessment	Improvements in the borrower's ESG rating and/or achievement of a recognised ESG certification.
Greenhouse gas emissions	Reductions in greenhouse gas emissions in relation to products manufactured or sold by the borrower or to the production or manufacturing cycle.
Renewable energy	Improvements in sourcing/producing sustainable products and/or quality products (using appropriate labels or certifications).
Social	
Employee engagement and diversity	Improvement in specific long-term goals relating to improvements in diversity and training and further education.
Employee health and safety	Improvements in the borrower's ability to create and maintain a safe and healthy workplace environmental that is free of injuries, fatalities and illness (both chronic and acute).
Governance	
Building strong corporate governance & transparency	Improvements in expertise of individuals sitting on the borrower's governance committees, e.g. audit committee, compensation committee, compliance committee and so forth.
Business ethics	Improvement in borrower's approach to managing risks and opportunities surrounding ethical conduct of business, including fraud, corruption, bribery and facilitation payments, fiduciary responsibilities, and other behaviour that may have an ethical component.

Table 1 shows some exemplary categories of SPTs, provided by the LMA, based on which KPIs can be derived. Due to the high individuality of each enterprise and the respective operations, KPIs might differ in importance and therefore the covenant structure might differ in degree of complexity. This is due to the different necessity for improvement in different sectors, meaning, that some industries need to focus more on their environmental impact whereas others should emphasize improvements in governance or social aspects. Consequently, there is not yet a standardized set of KPIs or SPTs for specific sectors and industries which results in a lack of comparability. (Thomson, 2022)

2.4.3 ESG-linked margin ratchet

The primary financial control mechanism which is currently used to reward or penalize performance on SPTs is the so-called ESG-linked interest margin ratchet ("ESG margin ratchet"). Wilkinson describes the general mechanism of margin ratchets as follows:

> Margin ratchets are provisions that tie the rate of interest to a borrower's operational performance. In a traditional leveraged facility margin ratchet, the interest payable on any one loan is reduced by a pre-agreed number of basis points if the borrower can evidence that: (i) no Event of Default has occurred and is continuing; and (ii) the ratio of debt-to-earnings falls within a certain threshold. (Wilkinson, et al., 2021)

Applying these principles to the sustainability-linked loan, the interest rate might be decreased if borrowers can prove that "(i) no Event of Default has occurred and is continuing; and (ii) … a certain number of … ESG criteria and/or targets" have been met. One problem of this mechanism is that so far, there is not yet a standardized scheme on the adjustment of the ESG margin ratchet.

Articles from various experts regarding the margin adjustments indicate, that a common approach is to divide into "one-way" and "two-way" margin adjustments. Beard and Roberts introduce a scheme, where the "two-way" margin is based on the number of SPTs satisfied. According to this system, the margin is only reduced if multiple SPTs are met. Vice versa, if no SPT is met,

the margin will be increased. (Beard & Roberts, 2021) Stanfield introduces another system in which the “one-way” interest adjustment is structured in a way that the interest margin will be reduced if borrowers succeed to meet the predefined SPTs while the margin will not be changed if the SPTs are not met. The “two-way” system according to Stanfield is different in the way that if borrowers drop below a predefined level in their sustainability performance, they will have to pay an additional premium to the lender. (Stanfield, 2021) A recent study investigating the European leveraged loan market in 2021 found that 31% of the loan agreements linked a margin reduction to each KPI (SPT) which was met, meaning that the interest margin could be decreased multiple times until it met a cap on the maximum reduction. In 54% of all deals, multiple KPIs had to be met to trigger a margin reduction, thereof in 46% of cases at least two had to be met and in 8% of cases at least three had to be met. The remaining 15% had a different focus and emphasized the growth levels of specific KPIs. (Reorg , 2021)

Usually, interest margins are to be adjusted annually. When it comes to the pricing perspective, there is not yet a framework on how much the interest margin is to be increased or decreased, which means that each lending facility needs to negotiate this as part of the loan agreement. Literature review showed that reduction or increase might vary between 2 and 75 basis points. (Stanfield, 2021) (Wilkinson, et al., 2021)

In the case of a covenant violation or breach, there are different ways for lenders to react. Common consequences include the increase of the ESG margin ratchet and/ or the introduction of a financial penalty. A possible scenario in the case of an extreme breach would be that all parties are obligated to stop accounting and advertising for the loan as sustainability linked. In the case of a covenant violation, a third consequence can be that borrowers are obligated to donate the financial amount, which they would usually save due to the discount, to any sustainability charity or fund. (D'Angelo, et al., 2021)

As the performance and progress of the borrower on the Sustainability Performance Targets must be measured, it is customary to include third parties

(e.g. accounting firms) which regularly revise borrower's performance. The SLL Principles issued by the LMA clearly state, that:

> "Borrowers must obtain independent and external verification of the borrower's performance level against each SPT for each KPI (for example, limited or reasonable assurance or audit by a qualified external reviewer with relevant expertise, such as an auditor, environmental consultant and/or independent ratings agency), at least once a year." (Loan Market Association (LMA), 2021)

This process of regularly measuring compliance with the Sustainability Performance Targets might be costly for lenders. (Zhang, 2021)

Another possibility to link ESG-performance to the adjustment of the ESG margin ratchet is based on the organization obtaining an ESG rating. (Wilkinson, et al., 2021) By using this method, the overall ESG-rating of an organization is examined before entering the loan agreement and an ESG benchmark is determined, along with a structured plan how and when to reach it. Progress on approaching this benchmark will be measured and if the performance is satisfying, the ESG-related decrease in the interest margin ratchet may be applied. One advantage of this method is that the borrowing organization is considered in a holistic way, including its long-term sustainability strategy. (Messini, et al., 2022) This is in contrast to the covenant approach, which mainly focuses on single Sustainability Performance Targets. Critics of the ESG-rating approach claim that there is still a lack of standardized ESG-scores and the ranking which is commonly performed by third-party ESG-advisors may differ greatly concerning the ranking methods.

2.5 Analysis of credit risk in sustainability-linked loans

2.5.1 Definition of credit risk

According to Apostolik, credit risk is constituted by various, measurable components which may cause a borrower to breach a contract, for example a loan agreement. The result of this breach of contract is then called default, which is defined as “the failure to repay or meet existing obligations.” (Apostolik, et al., 2009) Several risks impact the credit risk, including business risks, financial risks as well as structural risks as shown in the figure below.

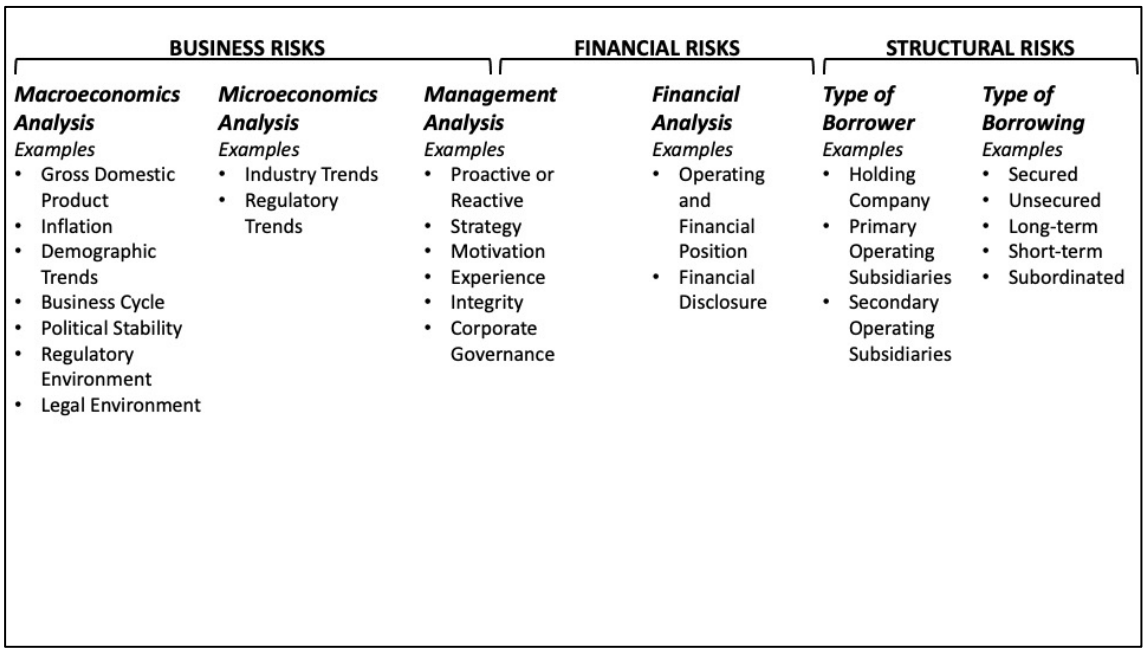

Figure 2: Credit risk areas, own representation based on (Schmoll, 1992)

Furthermore, Schmoll provides a division of credit risk into different risk components. First, he differentiates between active and passive credit risk whereby active credit risk is constituted by risk of default, liquidity risk and collateral risk. Risk of default is defined as the risk that borrowers are unable to repay the loan sum and related interest payments. Liquidity risk is constituted by a lack of liquidity which consequentially leads to the borrower not paying in a timely manner. Collateral risk describes the risk that the collateral suffers from premature depreciation subsequently not covering the payment claims of the

lender in case the collateral is sold. Passive credit risks can also be described as market risks and include the interest-change risk, monetary value risk, and currency risk. (Schmoll, 1992) As passive risks cannot be influenced by neither borrowers nor lenders, they will not be part of this work.

2.5.2 Quantitative aspects of credit risk

One common approach to quantify credit risk is to look at three main metrics: the probability of default (PD), loss given default (LGD), and exposure at default or amount outstanding (EAD). Probability of default is the probability that borrowers default on the loan, meaning that borrowers either do not make amortization payments and interest payments in a timely matter or do not pay at all. Loss given default describes the percentage of the loan which is not repaid in case of default. Both PD and LGD can be calculated and estimated based on available historical data and either internal or external credit-rating tools. Exposure at default is the amount outstanding expressed in currency terms. Usually, EAD is a predefined amount which is part of the loan agreement. Based on those metrics, the expected loss (EL) can be calculated by multiplying PD, LGD and EAD. (Baesens, et al., 2016)

$$EL = PD \times LGD \times EAD$$

2.5.3 Definition of credit risk assessment

It is crucial for lenders to analyse the overall credit risk to understand which conditions need to become part of the loan agreement to mitigate lenders' risk. As credit analysis or assessment does not follow a standardized procedure throughout financial institutions, there are various possibilities how to assess the risk. Generally, there are internal as well as external methods which can be used, for example internal scorecards, cash flow analysis or engaging an external rating agency. Based on this assessment of the overall credit risk, lenders make decisions about the amount to be lent, the necessity of collateral and type of collateral which secures the loan as well as interest rate and maturity of the loan, e.g. short, medium, or long-term. (Apostolik, et al., 2009)

2.5.4 Credit risk assessment in sustainability-linked loans

Due to the broad area of applications for sustainability-linked loans, credit risk assessment is an individual process for each loan agreement. Yet, the overall integration of sustainability into the process of lending and the question of how credit risk can be impacted by ESG factors have been discussed. Therefore, some general aspects can be derived from the literature and implications for credit risk assessment in sustainability-linked loans can be deduced.

Schoenmaker distinguished the management of credit risk in a sustainability context as either being based on risk-based or value-based banking. Following this distinction, in risk-based banking various environmental and social factors and risks, expressed in the form of sustainability criteria, affect the PD as well as the LGD. Consequently, these criteria need to be included in the credit risk assessment and impact the pricing of the loan, for example in the form of a risk premium or a higher loan spread. In value-based banking, lenders tend to finance projects with the objective of transforming the borrower's enterprise by adopting a more sustainable business model and implementing more sustainable operations. (Schoenmaker & Schramade, 2019)

Sustainability-linked loans seem to be located at the interface of the practices risk-based and value-based banking as they are supposed to help lenders to move towards a sustainable transformation, but the funds need not specifically be used for a predefined project. Furthermore, ESG factors are indeed included in the pricing of the loan, however not beforehand but by tracking progress on the SPTs constantly and consequentially adjusting the ESG margin ratchet.

Looking at the impact of the introduction of sustainability criteria or ESG data into the assessment of credit risk, different conclusions can be found in the literature. According to Zhang, the credit risk can be lowered through the integration of ESG based on the argument that ESG disclosure decreases information asymmetry between borrower and lender, enhances transparency which helps to improve the risk assessment and provides overall information about the borrower's viability. (Zhang, 2021) Many studies furthermore showed that the introduction of

sustainability criteria into the business model of an enterprise improves the corporate financial performance which in conclusion leads to a decreased financial risk for lenders. Additionally, Weber found that rating the credit risk of enterprises could be enhanced by including sustainability criteria. (Weber, et al., 2008)

Extensive research from China, where the green credit policy has been in place since 2007 and therefore allows to analyse many years of sustainable lending in the form of green credit, shows that the integration of green lending criteria into credit risk management leads to a decreased credit risk. A study carried out by Cui has revealed that banks with a higher green credit ratio tend to have a lower rate of non-performing loans, i.e. loans either being defaulted or threatened to be defaulted. (Cui, et al., 2018)

When it comes to single quantitative components of credit risk, McGarry found that “sustainable loan assets have lower default rates than their conventional alternatives“. (McGarry & Hauman, 2019) Coherent to this analysis, Barthruff stated that a generally lower probability of default in loans with ESG compliance can be observed. (Barthruff, 2014)

Opposed to these findings, Anginer proposed that credit risk might be increased especially for sectors and businesses which must be transformed fundamentally to become more sustainable. According to this analysis, extensive new regulations and laws put great pressure on “brown” industries which face higher costs and risks in the transformation process than other industries which are either per se sustainable or are easier to transform. Following this logic, lenders need to consider the related risks of potential environmentally harmful incidents in these industries which could increase the credit risk and therefore also increase the costs of debt. (Anginer, et al., 2020)

Looking at the overall research, literature indicates that the impact of including sustainability criteria into credit risk assessment leads to a mitigated credit risk for lenders, which is mainly due to increased transparency and disclosure about borrowers’ viability.

One limitation to this is that there is not yet enough evidence about the causal relation of sustainability performance measured, for example by means of ESG ratings, and lower credit risk. It could also be possible that those organizations

observed are just in an overall better financial position and therefore showing a lower credit risk. (Thomä, et al., 2019) Due to the relatively young age of sustainability-linked loans, there is furthermore not yet enough quantitative data to support generalizations about the credit risk of those loans. Additionally, it must be mentioned that due to the non-standardized approach of measuring progress on sustainability (e.g. covenants, ESG ratings, SPTs), one must be cautious about transferring previous findings to the issue of sustainability-linked loans.

2.6 Analysis of motivation for contracting a sustainability-linked loan

2.6.1 Concepts in economic decision-making

Why do lenders offer sustainability-linked loans and why do borrowers contract those loans? To analyse the overall motivation which might cause lenders and borrowers to enter a contract of a sustainability-linked loan, and furthermore identify different aspects and categories of the overall idea of motivation, some general concepts which affect economic decision-making will be used. Kühberger identified two pivotal concepts which mainly influence economic decision-making, namely the concept of value and the concept of risk. (Kühberger & Schulte-Mecklenbeck, 2017) The goal of this analysis is to analyse different aspects of value and risk which motivate lenders and borrowers to enter into a sustainability-linked loan agreement.

The first theoretical concept, the idea of value assumes that individuals and organisations try to maximize their experienced individual value by means of expected utility. According to the theory, decision-makers make decisions under uncertainty about the outcome while trying to achieve the best possible outcome, hence the highest expected utility. The higher the expected utility of a decision is, the higher it is ranked compared all possible decisions. (Briggs, 2019) Following this approach, financial and non-financial aspects that could increase the expected utility for both lenders and borrowers to choose an SLL over another loan agreement will be analysed under the assumption that all decision being made have the aim to achieve the highest expected utility for each decision-maker.

The second theoretical concept which will be used for the analysis is the concept of risk and uncertainty. First, a distinction between risk and uncertainty must be made. According to Toma, the key element used to determine the difference between risk and uncertainty is probability. Thus, risk can be qualified meaning that clear probabilities can be assigned to different outcomes. Contrary, uncertainty describes situations in which there is a lack of information, consequentially inhibiting the assignment of probabilities to different outcomes. (Toma, et al., 2012) In an economic context, both risk and uncertainty influence decision-making and together portray the environment in which lenders and borrowers must navigate. To understand how risk and uncertainty affect decision-making in the context of sustainability-linked loan agreements, risks and uncertainties will be analysed. The underlying assumption of the following analysis is that both lenders and borrowers try to reduce risk and uncertainty as far as possible. This can be done through means of quantitative analysis (e.g. credit risk mitigation) in case of risk and by assigning subjective probabilities to uncertain situations to make them quantifiable as well.

2.6.2 Lender's perspective on motivation

2.6.2.1 Lenders' value

When it comes to the lenders' perspective on value or utility of sustainability-linked loans, profits and profitability are one essential aspect. One way to look at the role of banks is to consider them financial intermediaries, responsible for accepting funds in the form of deposits and granting funds in the form of loans or other investments. (Dilley, 2008) Due to the very nature of our financial system, banks need to be profitable to survive and perform amongst multiple other tasks the task of being a financial intermediary. Therefore, it must be analysed how sustainability-linked loans affect lenders' profits and profitability to understand whether there is financial incentive for lenders to issue such loans.

According to Thomä, sustainability-linked loans affect banks' profitability negatively. One factor which decreases profitability is based on higher requirements in due diligence which is due to higher expenses for the

monitoring of the performance on SPTs as well as compliance to the covenants. Another factor is due to the very nature of sustainability-linked loans, which have contracted a possible reduction of the interest rate in the agreement when complying with the terms of the contract in a sufficient manner. This of course leads to a decrease in profitability over time. (Thomä, et al., 2019) According to Schoenmaker, “the difference (or spread) between the lending and borrowing rate determines a bank’s profitability.” (Schoenmaker & Schramade, 2019) Consequentially, the very nature of sustainability-linked loans leads to a conflict of interest for lenders since a good sustainability performance and compliance to the SPTs leads to a decrease in the interest rate through means of ESG margin ratchet adjustment and therefore results in the decrease in bank’s profits. It is also questionable, whether and how banks compensate for the loss of interest revenues in times of a very low prime lending rate, since this will further decrease revenues made from any interest-rate based business.

Contrary to this, one could also argue that due to an overall lower probability of default and therefore lower credit risk, as described in chapter 2.5.4, general profitability could be increased even though individual loan agreements might not perform well in terms of profitability.

Another financial incentive could be derived from the introduction of a supporting factor, which, in the form of a green supporting factor, is currently being discussed by the European Commission. The mechanism of the green supporting factor works in a way that banks are allowed to adjust the risk weight which is applied during the risk assessment of a green project. Consequently, the risk of a green project is lowered by the green supporting factor which allows banks to reduce their capital. This is because lower risk goes along with lower capital requirements which banks need to keep as a safety buffer. (Matikainen, 2017) If such a supporting factor would be introduced for SLL as well, as currently proposed by the European Banking Federation, banks could perceive an increased financial utility from granting SLL. (European Banking Federation, 2021) Reduced capital requirements for SLL incentivise the accommodation of such loans in a way that the capital which does not have to fulfil a buffer function can be used in other ways, e.g., for new investments.

There are also indirect financially beneficial consequences of sustainability-linked loan agreements, which could provide a big enough incentive for lenders to engage in sustainable lending. Due to the changing markets and the overall trend of rise in sustainable finance, banks face an opportunity to become early adopters, and gain competitive advantage and higher overall levels of competitiveness compared to peers which adapt sustainable lending practices later. (Balkan Green Energy News, 2021) The financial impact of long-lasting higher competitiveness is twofold. One the one hand, diversified product portfolios might attract new borrowers which would lead to in an increase in profits. On the other hand, existing relationships with borrowers can be optimized as lenders can support and accompany them through necessary transformation processes. As a result, losses in profit due to loss of customers can be prevented.

Lenders could also perceive a utility by adopting sustainable lending practices, i.e. by issuing sustainability-linked loans, in the area of policy compliance. As already mentioned earlier, there is an observable sustainability trend in policymaking, nudging financial institutions to adopt more sustainable business practices. Due to this, lenders might find it utility-increasing to signal certain efforts in this area. As there is still a lot of flexibility in the design of sustainability-linked loan agreements, the issue of greenwashing must be discussed in this area. According to Delmas, greenwashing can be defined as "the intersection of two […] behaviors: poor environmental performance and positive communication of environmental performance." (Delmas & Burbano, 2011) The increasing pressure from policy side together with the flexibility of SLL agreements, in for example how borrowers' sustainability performance is measured, could incentivise lenders to neglect intensive scrutiny of borrowers' sustainability performance while at the same time reporting on the agreement as being sustainable. Therefore, both lenders and borrowers would engage in greenwashing. Delmas suggests that higher regulatory standards would decrease this kind of greenwashing behaviour.

Opposed to this mere signalling of sustainability and corporate social responsibility (CSR), another source of motivation could result in altruistic

motives. According to Nizam, altruism in this specific context means that banks engage in sustainable activities for their own sake while neglecting financial performance, which results in non-financial value or non-financial utility for the lenders. In fact, several empirical studies investigating the general motivation for banks to engage in CSR improvement, for example by accounting for a higher number of sustainability-linked loans, found that altruism is one possible driver for sustainability improvement. (Nizam, et al., 2019)

2.6.2.2 Lenders' risk

Risk mitigation and the reduction of uncertainty can be important drivers for economic decision-making. Therefore, it must be analysed whether there are specific financial and non-financial risks or uncertainty which lenders aim to mitigate through sustainability-linked loan agreements.

In times of climate change, lenders aim to reduce sustainability risks as far as possible. (Thomä, et al., 2019) Sustainability risks include physical risks due to climate-change and altering weather conditions related incidents and accidents which can ultimately result in an increased default risk on a loan and changed overall market conditions. As many industries are currently facing and will in the future face the need for profound transformation, lenders are forced to restructure their client base in a way that reduces sustainability risk to prevent negative impact on profitability. (KPMG International, 2021)

A significant driver of the adoption of sustainable lending practices is the mitigation of reputational risks. Nienaber found that a bank's legitimization primarily depends on customers' trust regarding perceived compliance with law and regulation and secondly on the perception of how non-compliance is handled. (Nienaber, et al., 2014) If those two spheres are not treated with a high priority, banks are endangered of facing reputational damage. Therefore, banks include the possibility of their borrowers having a negative environmental impact, which will ultimately have a negative financial and reputational impact for banks, into risk management and therefore decision-making. (Schoenmaker & Schramade, 2019) But not only borrowers and other customers must be

considered when looking at reputational risk. Instead, there are other stakeholders like NGOs, which banks try not to upset to avoid negative consequences regarding their reputation. (KPMG International, 2021)

Another risk which banks might aim to decrease is the business model risk. As market conditions and the regulatory framework is changing, it is crucial for lenders to integrate sustainability and therefore sustainable lending practices into their strategy to avoid that their business model becomes outdated. (Schoenmaker & Schramade, 2019)

By engaging in sustainable lending practices and granting sustainability-linked loans, lenders additionally try to reduce the so-called climate transition risk with special focus on “the wide range of valuation differences over stranded assets, and also high levels of uncertainly over potential declines in market valuations and book values of corporate assets on intermediaries’ balance sheets.” (OECD, 2021) Stranded assets can be defined as assets which have lost value due to new regulations (e.g. very carbon-intensive machinery or fossil-fuelled vehicles). Stranded assets pose a risk to lenders when borrowers use them as a collateral for the loan agreement. In case of default, this kind of collateral bears the risk of not fulfilling its main purpose, namely the financial protection of the lender. (Weber & ElAlfy, 2019)

2.6.3 Borrowers’ perspective on motivation

2.6.3.1 Borrowers’ value

Similar to the lender’s perspective, borrowers also need to analyse whether and how entering into a sustainability-linked loan agreement affects their financial performance, e.g. profits and profitability. Thomä found that borrowers are financially incentivised to enter an SLL agreement through the possibility of interest rate adjustments. In the case of a non-sustainability linked loan agreement, as part of the risk assessment and interest rate calculation, lenders would usually carry out a peer comparison. Based on the results, a fixed interest rate is assigned. The utility of an SLL for borrowers is in this case based on the fact, that borrowers are assessed regarding other aspects than they usually

would be when applying for a loan and might therefore end up with a more beneficial loan agreement, financially speaking. (Thomä, et al., 2019)

Another perceived utility for lenders of sustainable debt could result from signalling. According to Kim, one motivation for borrowers who already have a relatively high ESG-rating before contracting a SLL is to demonstrate their willingness to make efforts in maintain this high level of ESG performance. (Kim, et al., 2022) Other recipient of signalling could be stakeholders like NGOs or the public. The recent affair, centred around the German corporation Volkswagen AG, has shown how much the public's opinion can affect an enterprise in the case of an environmental scandal. Entering a SLL and therefore engaging in sustainability performance improvement could be an important way to address this kind of external stakeholders.
Lastly, shareholders and other investors can also be the target of signalling. The very mechanism of a SLL usually increases borrowers' transparency by making reporting about ESG-performance mandatory. Overall, a higher transparency could result in borrowers becoming more eligible and attractive for investments and further accommodation of funds. (Raimo, et al., 2021)

Similar to lenders, borrowers might also perceive utility in purely signalling efforts in sustainability improvement without actually improving, resulting in green-washing or ESG-washing. Studies by Kim showed that borrowers who had a relatively low ESG-rating before entering a SLL agreement even showed deterioration in their sustainability performance after the conclusion of the contract. One explanation for this phenomenon is that the sustainability performance targets and related KPIs were either poorly defined or not detailed enough, leaving room for greenwashing behaviour. (Kim, et al., 2022)

It is doubtful whether borrowers' motivation to enter into a SLL agreement can also result from altruistic motives. Lenders' altruism stems from the fact that granting a SLL might even negatively impact the corporate financial performance but is ultimately beneficial for the society. In the case of the borrower, the SLL agreement is usually connected to fundamental change to the borrower's

organisation. To stay compliant with the contract and benefit from the possible discount in the interest rate, borrowers need to fulfil the predefined sustainability targets and therefore usually alter former operations or even alter physical structures. Due to this, one could argue that borrowers do not purely act out of altruism, but it is more likely that borrowers as well as lenders both experience a variety of perceived utilities and therefore a combination of different motivating factors.

2.6.3.2 Borrowers' risk

As the threat of climate change, natural disasters and the introduction of new policies change overall market conditions, borrowers might try to mitigate certain risks arising from all those factors by entering a SLL contract.

Similar to the lenders' reputational risk, borrowers also face the risk of damaged reputation when engaging into non-sustainable business operations. As described before, a SLL agreement might serve as a signal to stakeholders and shareholders that efforts in the area of sustainability improvement are being made. If the SLL agreement and the respective sustainability performance targets and related key performance indicators are chosen with scrutiny, the goal of the SLL is furthermore to not only signal but actually improve sustainability performance. Consequentially, a SLL decreases the risk of reputational damage by signalling efforts to important external parties while at the same time altering unsustainable business practices and therefore decreasing the risk of negative externalities. (Pineiro-Chousa, et al., 2017)

Another risk which is related to unsustainable business practices is the business model risk. It describes the risk of becoming outdated in terms of operations and business model. Therefore, borrowers might at some point face higher costs of debt, for example by means of higher interest rates, because lenders credit risk assessment showed a higher overall credit risk. Consequently, borrowers might enter into a SLL agreement to mitigate the business model risk and adapt to the changed needs. (Schoenmaker & Schramade, 2019)

As described in the section about lenders' risks, transitioning into a more sustainable economy comes with certain transition risks during the change process. These risks are highly individual, based on the organisation's needs and current level of development. Borrowers might try to mitigate these transitions risks through contracting a SLL. This is because SLLs can be used in a flexible manner which meets borrowers at their individual location on the way to more sustainability. (Casciano, 2022)

3 Industry analysis

3.1 Description of the method of analysis

The sustainable finance industry is relatively young and changing and growing at a fast pace. Consequentially, banks should be monitoring developments which are relevant for strategic decision making to stay competitive. The following chapter provides a driving forces analysis according to the method of Fleisher and Bensoussan. This technique helps organizations to manage critical long-term changes in the business environment by identifying the so-called driving forces. According to Fleisher, "the term "force" refers to the broad cluster of events, state of affairs, and/ or trends that impact the firm's future." (Fleisher & Bensoussan, 2007) In order to be defined as a driving force, the trend must be long-term and having a serious impact. At the same time, a driving force is always considered to include a certain extent of uncertainty. To make meaningful strategic recommendations, the driving forces must be identified and understood precisely. The identification of relevant driving forces is based on selecting those forces which influence competitive behaviour and the overall industry structure in a meaningful way. A PESTLE analysis serves as the foundation for identifying those driving forces. As a next step, a determination about the impact of the driving forces on the overall industry attractiveness is made. Lastly, strategic recommendations are given for a few selected driving forces which are considered to have the most impact for banks.

3.2 PESTLE analysis

In avoidance of missing important trends, the first step in identifying the strategically most relevant driving forces is carrying out a PESTLE analysis. This analysis investigates the macro environment of an organization, focusing on six different spheres, namely the political, the economic, the societal, the technological, the legal and the environmental spheres. (Bouzid, 2020) Similar to driving forces, trends that are identified in the PESTLE analysis belong to the external environment of an organization, are out of the immediate control of the organization and hard to influence and have long-term implications for the organization.

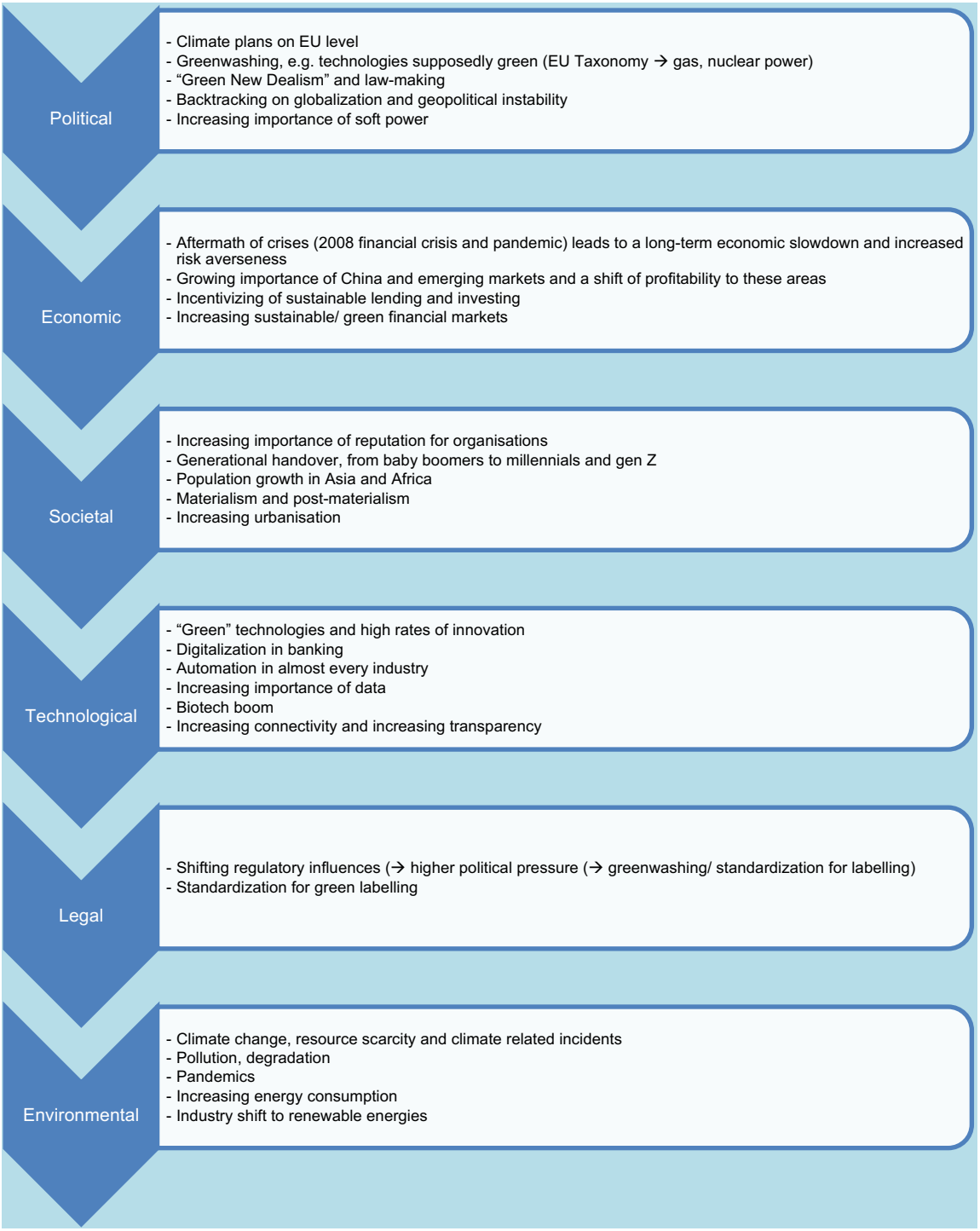

Figure 3: PESTLE analysis, own representation

3.3 Ranking of the driving forces

The following table contains the forces which have been selected under the premise of having the highest strategic importance for European banks over the next few years. A further hierarchization is necessary to understand which driving forces need to be addressed with which priority and to further clarify which driving forces can be influenced by the organization and to what extent.

To quantify the importance and uncertainty of the respective driving force, a Likert-scale, 1 being assigned to the lowest level of importance and respectively uncertainty, 4 being assigned to the highest level of importance and respectively uncertainty was used.

Table 2: Ranking of driving forces

Force	**Importance** **(1-4)**	**Uncertainty** **(1-4)**
"Green" technologies and high rates of innovation	4	2
Increasing connectivity and increasing transparency	3	2
Aftermath of financial crises	2	4
Increasing sustainable/ green financial markets	4	3
Backtracking on globalization and geopolitical instability	1	4
Climate change, resource scarcity and climate related incidents	4	3
Shifting regulatory influences	4	3

By visualizing the ranking into an importance matrix, it is further possible to understand the strategic implication of each driving force.

3.3.1 Strategic implication of the ranking

The following matrix template specifies the strategic implication of each box.

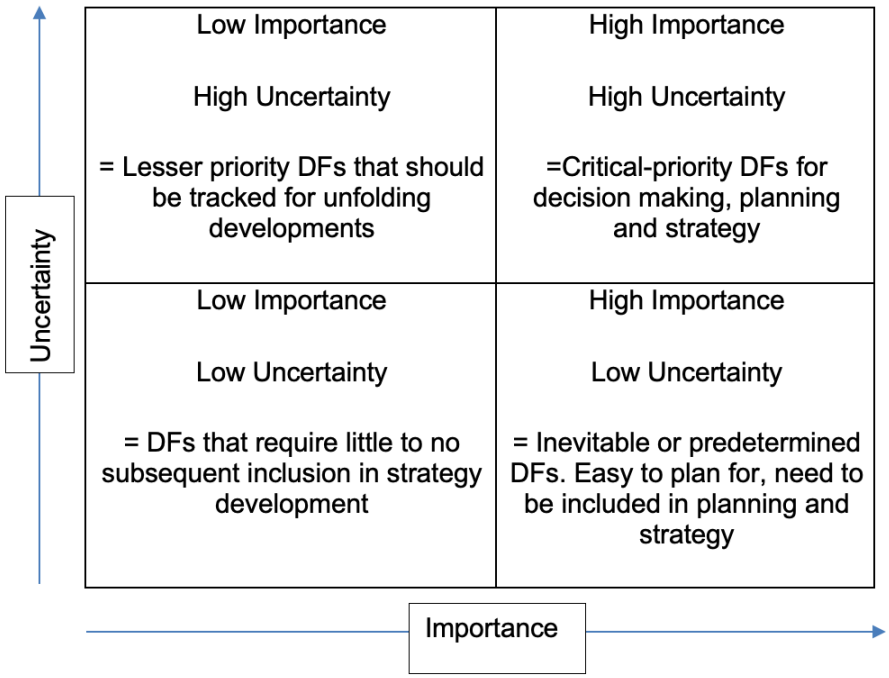

Figure 4: Importance/ Uncertainty Matrix, own representation based on (Fleisher & Bensoussan, 2007)

When placing the respective driving forces into the matrix it becomes clear, that climate change, resource scarcity and climate related incidents along with shifting regulatory influences and increasing connectivity and increasing transparency will be driving forces with critical priority which means that they must be considered carefully when planning the organization's strategy since those driving forces are considered to be highly important while coming with high uncertainty. "Green" technologies and high rates of innovation along with increasing sustainable/ green financial markets are equally of high importance but can be planned for more easily, since they show a lower degree of uncertainty which means that they should be included in strategic decisions but

can be monitored more easily. Backtracking on globalization and geopolitical instability both show a high degree of uncertainty which is why organizations have very limited possibilities to influence them but are of lower importance at the same time. Strategic implications are that those driving forces need to be considered in strategic decision-making to some extent, but the organization's focus should rather be on monitoring unfolding developments in those areas.

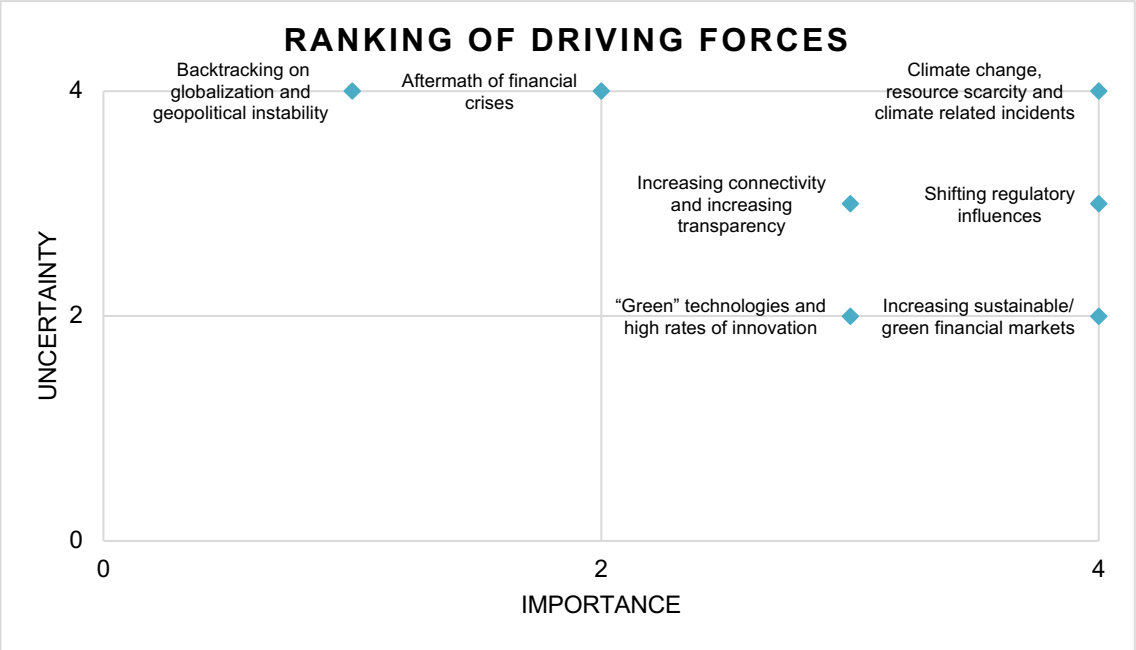

Figure 5: Importance matrix, own representation

3.4 Description of strategically important driving forces

The following sections provides a content-related description of the driving forces.

a) Climate change, resource scarcity and climate related incidents

Climate change is here to stay and the main driver for the so-called green transformation which includes restructuring the economy and sectors like construction, energy, transportation, agriculture, and waste management. Resource scarcity is the direct consequence of industrialization, decades of usage of fossil fuels and a lack of circular economy. It is especially important for

sectors which heavily rely on usage of natural resources but also affects humanity as a whole, for example when it comes to water scarcity. Climate related incidents arise from changes in weather conditions and include prolonged periods of droughts, as well as extreme weather events like floods, thunderstorms, and forest fires. (McCarty, 2001)

b) Shifting regulatory influences

Especially since the Parise climate agreement in 2015, an increasing momentum for “Green Dealism” all over the world could be observed. (World Business Council For Sustainable Development, 2020) Very often those agreements are accompanied by comprehensive regulation frameworks like for example the EU Taxonomy which aims at restructuring all economic sectors according to the individual “greenness” or “brownness” of every single economic process with special rules for the financial sector. Another example would be the new EU Corporate Sustainability Reporting Directive which structures the reporting on ESG metrics. (Frost, 2021)

c) Increasing connectivity and increasing transparency

Another megatrend which is shaping almost all economic sectors and industries is the increasing digitalization and automation. The financial sector in particular is experiencing a shift to a more data-driven finance. Additionally, information travels faster due to higher connectivity which consequentially requires increasing and enhanced transparency and communication. This is also implied since the accelerated traveling of information also means that scandals and therefore reputational harm happens faster with reactions being amplified. To be able to react sufficiently to those scenarios, decision making must become more dynamic. (Gaub, 2019)

d) Increasing sustainable/ green financial markets

According to the European Commission, the comprehensive transformation of all economic sectors will be financed by the EU, the national public sector as

well as the private sector. Overall, over €1 trillion of sustainable investments is supposed to be mobilized within the next decade. (European Commission, 2020)

e) “Green” technologies and high rates of innovation

Digital disruptions, high rates of innovation and emerging new technologies influence both society and economy on a large scale. (PwC UK, 2022) Together with other megatrends like climate change synergies for renewable technologies and energy are created and whole industries like for example the automotive sector are being shifted. Especially for climate change mitigation and adaptation new technologies play a key role. According to Gaub, “CO2 capture technology can directly facilitate 30% of the emissions cuts needed by 2030, and indirectly affect the rest through influencing consumer habits, scaling up a sharing economy and supporting business transformation to a circular economy”. (Gaub, 2019)

f) Aftermath of financial crises

Not only one but two financial crises are currently shaping and will for the next decades shape the global economy. Since the financial crisis in 2008, slow overall growth and high global debt weaken economies which have taken another strain caused by the COVID-19 pandemic starting in 2019. While the financial crisis in 2008 triggered a decade of historically low interest rates, the current global inflation is causing some economies to slowly raise interest rates again. A long-term stagflation along with a long-term economic slowdown could result from this development yet it is still questionable how interest rates will develop in the future. (World Business Council For Sustainable Development, 2020)

g) Backtracking on globalization and geopolitical stability

Another driving force is the restructuring of the global political economy with respect to backtracking on globalization and an overall geopolitical

destabilization often caused by economic and political compartmentalization. As crises like the climate crises do exist on a global scale, they require solutions on a global scale. This driving force has a major impact on the ability to solve these crises on a global scale and weakens the impact of global agreements (e.g., Trump leaving the Paris climate agreement) along with providing a higher risk for political, economic, and military conflicts (e.g., Russia's aggressive war in Ukraine in spring 2022).

3.5 Impact of the driving forces on industry attractiveness

To understand the impact of each driving force on the overall level of attractiveness within the sustainable lending industry, certain key questions must be answered. The following section will first evaluate the impact of the driving forces on the demand within the industry, then go on to examining the impact of the driving forces on the bargaining power within the industry and further answer the question how the driving forces influence the intensity of the competition within the industry. Lastly, an analysis of the influence of the driving forces on the overall profitability of the industry will be made. For this analysis, previous results from the analysis of the sustainability-linked loan will be used as well.

a) Are the driving forces causing demand for the industry's products to increase or decrease?

Climate change, resource scarcity and climate related incidents will ultimately increase the demand for sustainable financial products. For one, more and more organizations aspire to become "bulletproof" for failing business models due to limited resources and at the same time minimize the risk for stranded assets. In consequence, this will lead to an increase in demand for green and sustainable debt as the transformation requires heavy investments. Additionally, climate-related insurance is also likely to grow. As described before, financial markets are also adapting to these shifts in whole industries by offering more and more opportunities for investors who seek to increase their green and sustainable ratios within their portfolio. This development can be observed by

the increasing number of green bonds and investment funds with an emphasis on ESG rated stocks.

The shift of regulatory frameworks and reporting standards is highly likely to increase supply within the industry as organizations will be forced to adapt for example their green asset ratio or will be incentivized to offer respective products due to lower capital requirements for financing specific projects. This does not necessarily mean that demand will follow supply in a way that the number of borrowers or investors will increase. In case that there is still a gap between demand and supply in which demand is higher than supply, demand might increase. At the same time, higher supply could also result in competition between suppliers and therefore the market dynamic might shift more towards a customer market. Another factor is that at some point it is very likely that all organizations for which reporting is mandatory will also be affected by the shift in legal regulations which means that the pressure for green and sustainable transformation will increase. Consequentially, demand in certain areas like green project finance, sustainability-linked and green loans will rise as those products are usually more advantageous to finance the transformation.

The trend of increasing connectivity and transparency is very likely to increase demand as this development forces organizations to ensure that their reputation is not damaged by climate related scandals (e.g., the Volkswagen emission scandal). Together with more concise reporting standards, organizations will probably be hindered from mere greenwashing and need to engage in verifiable sustainable business practices, which would then again result in higher demand for sustainable financial products. As described before, the green and sustainable finance industry is currently characterized by a high-growth market and is likely to grow more in the future. Here again, it is questionable whether demand will follow supply. As the green transformation is a long-range and great challenge which will affect virtually every economic sector, it is likely that at least for the next decade demand will grow.

More and more “green” technologies are being developed due to high rates of innovation which provide great opportunities for investment. This development will increase demand for green and sustainable investment. At the same time, it might also increase demand for green and sustainable debt, as organizations who aim to protect themselves from climate change related incidents and reputational damage need to invest into new technologies.

The aftermath of the financial crisis in 2008 as well as the recession which was caused by the COVID-19 pandemic could have opposing effects on demand. On the one hand, current investments opportunities for sustainable growth could be used to kickstart economies which could provide huge opportunities for sustainable growth. Low interest rates make it very attractive for borrowers to take out loans. One the other hand, recession, and a potential stagflation due to the increase of interest rates by the EZB and the Fed might lead to decrease in demand for debt as well as investment as taking out corporate loans will be more expensive and stock-listed corporations with a high amount of borrowed capital will face difficulties to pay back those loans. This might lead to a higher volatility of shares which could incentivize investors to switch to more secure investments like sovereign bonds.

Backtracking on globalization and threats to global geopolitical stability could impact demand within the green and sustainable finance industry in an adverse way. On the one hand, military, and political conflicts like Russia’s current aggressive war in Ukraine sharpen the overall awareness of resource dependencies and increasing prices of raw materials and energy sources. As a result, more and more organizations and even governments will aim to become energy self-sufficient, for which a possible strategy could be the extension of green energies like solar or wind power. This development would lead to a strong increase for sustainable and green debt as the transformation of the energy sector is associated with high costs. On the other hand, to effectively mitigate climate change, global binding agreements are needed as the climate crisis is a global crisis as well which results from global processes like globalization. When powerful economies like China and the United States are

not binding themselves to the same standards regarding climate protection and agreements regarding the reductions of GHG emissions, the global green and sustainable finance industry can be weakened by decreasing demand. Yet, for the European markets no such tendencies are to be expected within the next couple of decades, as the European countries have committed themselves to specific reductions of GHG emissions until 2050.

b) Are the driving forces making the bargaining power of other industry participants higher or lower?

Climate change, resource scarcity and climate related incidents will increase the bargaining power of those industry participants who already have taken a lead in adapting to the changing landscape of the financial industry and can therefore offer a broader portfolio of green and sustainable financial products. As this is not correct for most industry participants, it is very likely that a few industry participants will benefit from increased bargaining power whereas the majority of the industry participants will have decreased bargaining power.

When it comes to shifting regulatory influences and increasing connectivity and transparency, the same logic applies. Some participants who have taken over the role of being pioneers will benefit from more regulation and more binding targets regarding the green transformation by gaining more bargaining power in contrast to ill-prepared competitors. Especially those institutions which have already internally addressed the issue of sustainability and data transparency and integrated it into the strategy will benefit. As the sustainable and green financial markets are still growing, so will the prospects of some industry participants who are entering the market. At the same time, growing supply will also cause a competition for demand leading to an overall decrease in bargaining power. Sooner or later, industry participants will have to develop specific areas of expertise, offer niche products, or implement competitive prices to differentiate from other competitors. Yet, this is not a development which should be expected soon, as the industry is far from being saturated and still growing at a fast pace.

Innovation and new, green technologies are key drivers for the green transformation of whole economic sectors which are forced to adapt as quickly as possible. Consequentially, those sectors must invest heavily into the adaptation of their industry which again must be financed and offers great possibilities to invest. Depending on the urgency to raise capital for the financing of these new technologies, industry participant might experience a slight decrease in bargaining power. At the same time, more and more industry participants will aim to benefit from those trends which means that supply will increase. A consequence of an increase in supply is always that overall bargaining power within suppliers decreases.

The aftermath of the financial crisis in 2008 and the current threat of a global recession and stagflation will probably lower the bargaining power of all industry participants. On the one hand, the current developments of slightly rising interest rates means that banks will be able to generate more profits from giving out loans. On the other hand, borrowers must carefully evaluate their abilities to meet the loan conditions and repay those loans which could lead to a decrease in demand. In the case that overall demand in Europe decreases due to recession-like developments like rising inflation rates, borrowers might postpone certain investments to minimize risks and capital costs. This kind of development could also lead to a decrease in demand. With overall decreasing demand and steady or increasing supply, the bargaining power of suppliers decreases.

Backtracking on globalization and threats to overall geopolitical stability might have indirect negative effects on the bargaining power of lenders. One example for this is Russia's aggressive war in Ukraine which started in spring 2022 is a main driver of rising inflation rates in Europe, as it destabilizes financial markets, reinforces existing supply chain problems and shortages, and drives up energy prices. The negative impact of those rising inflations rates on suppliers' bargaining power has been described in the section before. Another negative effect of backtracking on globalization might result from the different perspectives of global players on the climate crisis. As indicated before, the

climate crisis is a global crisis which must be solved on a global scale. If global agreements on climate change mitigation and emission reductions are weakened, the overall momentum, which is a main driver for the fast market growth in sustainable finance, could be weakened and so could demand. Yet, there is quite a high consensus within the European Union when it comes to the assumption of responsibility for climate change mitigation which is expressed in the regulations and laws like the EU taxonomy. Therefore, it is not to be expected that this driving force will have a significant impact on the industry's bargaining power.

c) Are the driving forces acting to make competition either more or less intense?

Climate change, resource scarcity and climate related incidents will increase the competition within the sustainable finance industry. Looking at the current market situation, the market is still growing at a fast pace as more and more industry participants adapt to changing regulations and customer demands. This also means that the threat of new entrants is high, as more and more banks adapt their existing business models to the changing market conditions.

The same is true for the shift of regulatory influences together with the trend of increasing connectivity and transparency as those force banks into stress testing their business model for climate related incidents as well as pressuring them into becoming more sustainable themselves and providing proof for sustainable business activities.

The trend of increasing green/ sustainable financial markets itself indicates already, that competition will become more intense as this is the direct consequence of a growing market. So-called "green" technologies and generally high rates of innovation function as a direct driver of the growth of green/ sustainable financial markets and are therefore indirectly reinforcing competition.

The aftermath of the 2008 financial crisis and the recession and inflations tendencies caused by the COVID-19 pandemic and the Russian aggressive war might have adverse impacts on competition. On the one hand, some industry participants might suffer from those developments economically in a way that they must exit the market, which would decrease competition. On the other hand, it is very likely that more and more participants will alter their current business model to survive. As the general focusing on sustainability is currently and will be in the foreseeable future a relatively reliable market trend, it can be expected that competition in this area will increase.

The backtracking on globalization might lead to a decrease in competition, as it could make foreign industry participants shift their focus and leave European markets. At the same time, the potential gap resulting from this will probably very quickly be filled by other European industry suppliers. Therefore, this driving force will probably not have a noteworthy impact on the intensity of competition.

d) Will the driving forces lead to higher or lower industry profitability?

The previous analyses of the driving forces regarding development of demand, bargaining power and competition show that an overall increase of supply of sustainable financial products can be expected. At the same time, demand will increase as well which leads to an overall higher volume of the market. The driving force which is now of particular interest to evaluate whether all other developments will lead to higher or lower industry profitability is the aftermath of the financial crises. While it can be relatively safely assumed that overall returns in the market will increase, it is questionable whether this will also cause increased profitability. This is because the profitability of such loans is directly related to the interest margin which is influenced by overall economic developments such as inflation, threat of recession and adaptions of the base rate. Due to high European rates of inflation, the previous period of historically low base rates is likely to come to an end which would increase profitability of margin-based transactions such as the sustainability linked loan. Yet, the high rates of inflation and higher base rate will also cause businesses to decrease

their amount of borrowed capital to minimize risk as well as investigating carefully which investments could be postponed. Therefore, it is very likely that if a higher profitability within the industry occurs, it is rather related to the volumes than margins. Another determinant of the profitability of loans is the credit risk. As indicated in the analysis of credit risk of sustainability linked loans, a lower credit risk is associated with this kind of financial product, meaning that overall profitability might be higher in sustainability linked loans than in conventional loans. Especially looking at the sustainability linked loan, increasing demand and supply and an overall growth of the market would then mean, that profitability rises.

4 Discussion

4.1 Conclusion and strategic proposals for selected driving forces

The following sections discusses a few selected driving forces which have been identified as having the biggest strategic impact. Specific proposals are made on how to integrate the impact of the driving forces on the industry into a bank's strategy to strengthen the ecosystem of the sustainability-linked loan.

a) Shifting regulatory influences and increasing connectivity and increasing transparency:

Banks need to develop and understanding that these driving forces are crucial for reputation and the establishment of trust within the market as well as being a matter of internal process efficiency. For one, new regulations always pose a threat, as they might narrow the margin of operation for traditional and existing business practices. This is especially true for sustainability-related regulations, as there is not yet a common definition or understanding for integral parts of sustainability-linked loans, like for example a common framework for ESG-criteria or the KPIs which must be defined for this kind of loan. It is therefore advisable to keep track of political decision-making to strategically match the bank's own framework for sustainability-linked loans with the governmental

requirements. To prevent greenwashing allegations, it is sensible to introduce extensive and concise ESG-frameworks early on and update them regularly along with developing homogenous sets of KPIs for specific sectors to provide comparability. New regulations can also provide great opportunities for the sustainability-linked loan, like the introduction of a green supporting factor. As this would incentivise offering sustainability-linked loans, it could at the same time increase the bank's financial volatility which is due to the potentially higher debt-equity ratio. Again, the strategic implication here is to embed sustainability into the strategy early on to be able to position the bank very clearly. As the introduction of new regulations and related obligations to monitor compliance is always a matter of resources like personnel and skills, it is advisable for banks to develop strategies how to efficiently deal with the new regulations. Part of this can be the renewal of the IT infrastructure to make mandatory processes fast and efficient.

b) Increasing sustainable/ green financial markets:

The impact of the driving forces which are shaping the sustainable financial industry on demand for sustainable financial products in general and sustainability-linked loans in particular can be expected to be an overall positive one. Most of the driving forces which have been analysed will most likely drive demand in the foreseeable future, and so does the driving forces of increasing sustainable/ green financial markets itself. As this also means that competition is very likely to increase, banks should aim to integrate sustainability into their strategy and product portfolio as soon as possible to gain an early-adopter advantage which could result in higher bargaining power in contrast to the following early and late majority. A special focus could be put on SMEs as they make up for about 99% of all European firms. The benefits of focusing on SMEs is twofold: For one, sustainability-related reporting is not yet mandatory for SMEs but there is a good chance that it will be introduced at some point. Secondly, as SMEs can usually not fall back on the same financing as corporations such as bonds and shares, meaning that they heavily rely on loans and credit lines. This could provide new business areas for the sustainability-

linked loan which is also being recognized by other participants in the market like start-ups, who are very likely to increasingly try to reap those low-hanging fruits. It is therefore advisable for banks to increase their reactive capacity to be able to engage with potential new fields of customers as fast as possible. An important part of this shift to a customer-centred perspective on the market would include offering more services like advising businesses in terms of specific government subsidies to finance the green transformation.

c) “Green” technologies and high rates of innovation:

As an important driver of the transformation of many CO2-intensive industries, new climate-friendly and technical innovations can pose new business opportunities for banks as well as posing business risks. It is therefore advisable that banks monitor such developments carefully to be able to proactively approach potential new customers (e.g. SMEs) for the sustainability-linked loan. This is important not only because innovations can offer interesting new investment opportunities but also in terms of competitor monitoring. More and more competitors enter the sustainable finance industry offering alternative deliberately low threshold financing methods or even allow SMEs to access to capital markets. (OECD, 2015) Banks should therefore aim to develop new business models and re-innovate themselves to satisfy the more and more dynamic needs of the market.

d) Aftermath of financial crises:

When it comes to the overall economic situation in Europe, banks must monitor the development of the inflation rate and the threat of a potential stagflation carefully. Besides that, sustainability-linked loans could provide an opportunity when it comes to credit risk. With higher inflation rates, especially poorly rated credits pose a higher credit risk. The analysis of the credit risk of sustainability-linked loans in this paper showed that there is potentially a connection between the focus on sustainability and a lowered credit risk. This is also since borrowers of sustainability-linked loans are monitored more closely and not only need to prevent breaching the loan conditions but need to actively make efforts

to improve overall sustainability. Besides that, banks should also challenge their traditional self-perception and adapt new business models which are not purely reliant on margins. As mentioned before, offering more services, and enhancing the role as a sustainability services provider could be a new business opportunity.

e) Backtracking on globalization and geopolitical stability:

The “Brexit”, the Russian aggressive war in Ukraine, the pandemic – the European Union has been hit by multiple crises with severe economic consequences during the last years and banks need to prepare for a prolonged period of volatility. General strategic implications which arise from this is restructuring product portfolios and untangling the linking of the globalized financial markets. Especially for the sustainability-linked loan, the current geopolitical situation can also provide new business opportunities. As the Russian aggressive war caused massively increased energy prices, a momentum for an energy system transformation has been created. Banks could proactively use the chance to position themselves as a provider of funds for transformational projects like this.

4.2 Limitations of the research

Due to the sustainability-linked loans relative new introduction in European banks’ product portfolio and lack of statistical data, this study is mostly based on qualitative rather than quantitative research. Where the available statistical data was insufficient, syntheses from qualitative characteristics and quantitative studies in the general area of loans have been made. Especially for the analysis of the profitability and credit risk of the sustainability-linked loan, quantitative research should be carried out as soon as the necessary data for a meaningful sample is available. Furthermore, some of the strategic recommendations are based on future political scenarios. Due to the time constraint, it is not possible for this study to evaluate the outcome of certain political processes to give strategic recommendations.

4.3 Opportunities for further research

As this study is mostly based on the lender's perspective, more research from the borrower's perspective should be done in the future. A special focus could be put on evaluating the motivation of both lender and borrower to contract a sustainability-linked loan. This research could be carried out in the form of in-depth interviews. Lastly, as soon as the necessary and meaningful data is available, comprehensive quantitative analysis of the financial impact which contracting a sustainability-linked loan has on both, lender and borrower, should be carried out.

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