

**Assessment of the Disruptive Potential and
Emergence of a Dominant Business Model at
Online Lending Marketplaces**

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List of Acronyms

ABS	Asset-Backed Securities
BCBS	Basel Committee on Banking Supervision
BM	Business Model
BMC	Business Model Component
BMI	Business Model Innovation
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
DI	Disruptive Innovation
DP	Disruptive Potential
ECB	European Central Bank
EU	European Union
FinTech	Financial Technology Company
FTC	Federal Trade Commission
CAGR	Compound Annual Growth Rates
GR	Growth Rates
KfW	Kreditanstalt für Wiederaufbau
LPT	Loan Provision Technology
OLS	Ordinary Least Squares
PDI	Potential Disruptive Innovation
P2I	Peer-to-Incumbent
P2P	Peer-to-Peer
SBA	Small Business Administration
SBL	Small Business Lending
SEC	Securities and Exchange Commission
SME	Small and Medium-Sized Enterprises
SSM	Single Supervisory Mechanism
TA	Total Assets
U.S.	United States
UK	United Kingdom
US	United States
USA	United States of America
VHB	Verband der Hochschullehrer für Betriebswirtschaft e.V.

1. Introduction

With the advent of the internet and e-commerce in the 1990s, innovative business models such as the platform economy and the sharing economy have emerged (Belk, 2014; Botsman & Rogers, 2010; Eckhardt & Bardhi, 2015; Kenney & Zysman, 2015; Venkatraman et al., 2014; Trabucchi et al., 2019; Amit & Zott, 2001). These business models are often implemented on digital two-sided or multi-sided platforms (Clauss et al., 2019), which are characterized by multiple user groups and network effects (Parker & van Alstyne, 2005). They pose a potential threat to business models from established industries, especially those of analog origin that serve only one side (Zhu & Furr, 2016; Furr, 2016). Research on platform business models has so far mainly focused on general aspects (Taeuscher & Laudien, 2018; Gatautis, 2017), but increasingly addresses the connection with disruptive innovations (Habtay & Holmén, 2014; Shaughnessy, 2016; Zhang et al., 2018; Ozalp et al., 2018; Sampere, 2016). In parallel, research on disruptive innovations is increasingly oriented toward ex-ante aspects and the disruptive potential of innovations. Nevertheless, a validated methodological framework that considers the special features of digital two-sided platforms is still absent (Christensen et al., 2018; Kammerlander et al., 2018; Madjdi & Huesig, 2011; Habtay, 2012; Habtay & Holmén, 2014). This constitutes the first research gap (Research Gap 1): the lack of a validated framework for the ex-ante assessment of the disruptive potential in digital two-sided platforms.

When forecasting the disruptive potential of digital two-sided platforms, the development of business models plays a crucial role, as it determines how value is created, delivered, and captured (Osterwalder & Pigneur, 2010). However, the development of platform business models remains a largely under-researched field (Zhao et al., 2020). This constitutes the second research gap (Research Gap 2): the lack of research on business model development in the context of digital two-sided platforms.

Several studies suggest that there is a transition phase in business model development in which different configurations are explored before a prevailing dominant structure becomes widely adopted within the industry (Schallmo, 2014; Ramin, 2017; Chesbrough, 2010; McGrath, 2010; Doganova & Eyquem-Renault, 2009). Although the topic of

“dominant design” is highly relevant and increasingly important across industries, it has predominantly been studied in the context of technological and product innovation (Utterback & Abernathy, 1975; Suárez & Utterback, 1995; Srinivasan et al., 2006; Brem et al., 2016). Its application to business models, particularly in regulated service industries, has received limited attention (Simmons et al., 2013; Schallmo, 2014; Ramin, 2017). This constitutes the third research gap (Research Gap 3): the lack of research on dominant business model designs in regulated service industries.

The interaction between digital platform business models and disruptive innovations is transforming entire industries, particularly evident in the banking sector and its retail segment (Gaar et al., 2021; Temelkov, 2018). Since the 2008 banking crisis, regulatory changes, increasing globalization, digitalization, and connectivity have accelerated the emergence of potentially disruptive business models in this sector (Borgmeier, 2009; Floegel & Beckamp, 2020). Financial technology companies (FinTechs), with their platform-based business models, pose a potentially disruptive threat to traditional companies in the banking industry. Among the various FinTech subgroups, online lending marketplaces are considered one of the fastest-growing areas globally (Chen et al., 2021; Widyanto et al., 2022). These digital two-sided platforms match lenders and borrowers and manage loan obligations (Widyanto et al., 2022). Since the launch of the pioneering online lending marketplace Zopa in the UK in 2005, this form of credit intermediation has spread rapidly worldwide (Davis & Murphy, 2016; KPMG Siddharta Advisory, 2018; Widyanto et al., 2022). Today, it is one of the most important FinTech subgroups in the UK, the USA, Europe, and China, and is expanding in regions such as Australia, South Korea, Japan, and India (Lynn et al., 2019; Widyanto et al., 2022).

Due to the identified research gaps and the recent developments in the banking sector, my dissertation focuses on online lending marketplaces as the empirical research object. These digital two-sided platforms represent a potential disruptive innovation that increasingly challenges traditional banks. Despite growing academic and practical interest, key theoretical and empirical gaps remain, particularly regarding the ex-ante assessment of disruptive potential and the emergence of dominant business models of digital two-sided platforms in regulated service industries. Understanding these dynamics

not only addresses theoretical gaps but also provides guidance for different stakeholders to anticipate and shape the development of online lending marketplaces.

Accordingly, my dissertation addresses these gaps by answering two overarching research questions.

Research Question 1: “How can a framework be developed and applied to assess the disruptive potential of online lending marketplaces?”

Research Question 2: “How and why has a dominant business model emerged at online lending marketplaces?”

Three papers form the core of this dissertation, all co-authored with Prof. Dr. Stefan Hüsigg and Prof. Dr. Christoph Schmidhammer. The first paper develops, applies, and validates a method to assess the disruptive potential of digital two-sided platforms, using the case of online lending marketplaces in Germany. A qualitative case study approach was chosen for the investigation. The second paper presents a theory on the emergence of a dominant business model of online lending marketplaces in Germany. A mixed-methods approach was used, combining qualitative case studies and quantitative analyses of key financial figures. The third paper extends the perspective to an international context to examine whether the business models of market leaders in established countries (the UK, the USA, and Germany) are converging, particularly concerning customer segments and value propositions. A qualitative case study approach was used, and a generic, process-oriented model was developed to explain the convergence process.

My dissertation is structured as follows: In Section 1.1 of this introductory chapter, I outline the theoretical background on disruptive innovations, digital two-sided platforms, business model innovation, and dominant designs. In Section 1.2 I provide an overview of my dissertation. I first embed the three papers in the theoretical foundation, then summarize their structure and content, and finally describe the methodological approaches applied in each paper. The following three chapters form the core of the dissertation: Chapter 2 presents Paper 1, Chapter 3 presents Paper 2, and Chapter 4 presents Paper 3. This is followed by the conclusion in Chapter 5. First, in Section 5.1, I summarize the main findings of the three papers and provide answers to my overarching

research questions. I then discuss the contributions to research in Section 5.2 and the implications for practice in Section 5.3. In Section 5.4, I point out the limitations of my research and formulate the need for further research. My dissertation closes in Section 5.5 with concluding remarks.

1.1. Theoretical Background

This section introduces the core theoretical concepts that underpin my dissertation. I first present the theory of disruptive innovation before outlining concepts related to digital two-sided platforms, business model innovation, and dominant designs.

1.1.1. Disruptive Innovation

The theory of disruptive innovation, developed by Christensen (1997), distinguishes between “sustaining innovation” and “disruptive innovation” (Christensen & Raynor, 2003). Disruption is not only driven by technological change but can also result from fundamentally new business models that change how value is created, delivered, and captured (Christensen et al., 2015; Markides, 2006). Sustaining innovation is the improvement of an existing offering in the established performance characteristics that the main customers of an existing market value, regardless of whether these are small improvements or completely new developments (Keller & Huesig, 2009). In contrast, a disruptive innovation is a new bundle of performance characteristics that is introduced by a new market participant (entrant) and displaces the established market participants (incumbents) in the long term (Rafii & Kampas, 2002). This new offering is initially inferior or different in terms of the performance characteristics valued by the incumbents’ main customers and usually cheaper than the incumbents’ offerings. The new disruptive offering targets customers who are overserved by incumbents and unwilling to pay for further performance improvements (overshoot customers) (Anthony et al., 2008; Christensen et al., 2004). Customers who are not customers of the incumbents are also addressed (non-consumers). Both customer groups value the distinct performance characteristics and the typically lower price of the disruptive innovation. Due to the inferior or different performance characteristics from the incumbents’ point of view, the disruptive innovation starts at the lower end of the existing market (low-end disruption)

or in a completely new market (new-market disruption) (Christensen et al., 2004). Disruptive innovations often represent a hybrid form that serves both types of market entry (Christensen et al., 2004; Christensen & Raynor, 2003). A disruptive innovation must be evaluated in relation to the existing business model, because an innovation can be disruptive for one company and sustaining for another (Christensen et al., 2004).

Incumbents allocate their resources primarily to their main target customers and in accordance with the value network they have built up over the years (Christensen, 1997; Keller & Huesig, 2009). They create ever better and more expensive offerings for their still willing-to-pay main customers (undershoot customers), with which they can generate higher profits and expand their market position against their competitors. As the market share for the new disruptive offering is initially very small, uncertain, and unprofitable for them, a disruptive innovation is often not noticed or ignored at the beginning. However, entrants continue to expand their initially completely different value network. Meanwhile, the new offering evolves and attracts more and more overshot customers and non-consumers until it is good enough to penetrate the incumbents' main market and persuade customers there to leave (Christensen & Raynor, 2003; Christensen et al., 2004). As the offering matures, entrants often move upmarket, targeting even more profitable and demanding customer segments (Christensen & Raynor, 2003). Then it is often too late for the incumbents to react adequately and they lose more and more market share to the entrants until they are forced out of the market (Christensen & Raynor, 2003; Christensen et al., 2004).

This development highlights the need for incumbents to recognize disruptive innovations at an early stage to be able to react to them in a timely manner. For this reason, the concept of the disruptive potential was developed. It serves as a tool for the ex-ante analysis of innovations that could become a disruptive innovation in the long term (Huesig et al., 2005; Keller & Huesig, 2009; Lim & Anderson, 2016; Rafii & Kampas, 2002; Habtay, 2012). The disruptive potential assesses the extent to which entrants will cause incumbents to fail with their new offering. Accordingly, innovation is measured using various criteria based on the theory of disruptive innovation by Christensen (1997). As disruptive innovation is a long-term process, the disruption process can be divided into

phases (Christensen et al., 2004; Huesig et al., 2005; Rafii & Kampas, 2002). The disruptive potential can vary in the different phases and change when analyzed again. A disruptive innovation can only be successful if it at least fulfills the performance characteristics of the established offering in the long term (Christensen, 1997). High disruptive potential means that incumbents are at high risk of being pushed out of the market by the entrants' offering. In turn, it also shows the opportunities for entrants to be successful with their potentially disruptive innovation. This concept can therefore be used by both sides for strategic decisions (Keller & Huesig, 2009; Huesig et al., 2005; Kaltenecker et al., 2013).

1.1.2. Digital Two-Sided Platforms

While the theory of disruptive innovation explains how new entrants challenge incumbents over time, it pays little attention to market structures that can shape or accelerate disruption. This becomes particularly evident in the case of digital two-sided platforms, whose success is closely tied to network effects. These platforms are often referred to as "two-sided markets" due to their positive external effects on both sides of the market (Rochet & Tirole, 2003; Kenney & Zysman, 2015; Venkatraman et al., 2014). Croll and Yoskovitz (2013) emphasize that both sides of the platform are further characterized by complementary offerings and user interests, which can also contradict each other. These dynamics result in structural interdependencies that increase the complexity of platform management (McIntyre & Srinivasan, 2017).

A defining feature of digital two-sided platforms is the presence of network effects, which can be divided into direct and indirect as well as same-side and cross-side network effects. Direct network effects result from an increasing number of users, while indirect network effects are caused by the emergence of alternative or complementary products and services (Barasinska et al., 2011; Parker & van Alstyne, 2005; Rochet & Tirole, 2003). Indirect network effects can also occur between the users on one side of the platform. Here, one group observes the activities of another group and adjusts its behavior accordingly. This dynamic contributes to the reduction of information asymmetries between the different groups on the same side (Ribeiro-Navarrete et al., 2021). In the case of same-side network effects, an increasing number of users on one side of the platform

leads to an increase in value for the users of the same side (Parker & van Alstyne, 2005). In contrast, in the case of cross-side network effects, an increasing number of users on one side of the platform increases the value for users on the other side. This can occur, for example, through the reduction of search costs, the creation of alternative or complementary offerings, and an expanded selection of users (Rochet & Tirole, 2003; Boudreau & Jeppesen, 2015).

The interaction between these network effects is crucial for the long-term success of digital two-sided platforms (McIntyre & Srinivasan, 2017). Success depends on both sides being attractive to each other, as their interaction is essential and neither side can exist without the other. Platform operators typically face the challenge of the “chicken and egg” problem, where it is difficult to serve both sides of the platform simultaneously (Croll & Yoskovitz, 2013; Song et al., 2018). To overcome this challenge, operators often prioritize the revenue-generating side while subsidizing the other, which is treated as financially neutral or operated at a loss, to reach critical mass and activate network effects (Croll & Yoskovitz, 2013; Song et al., 2018; Boik, 2018). However, long-term success requires a sustainable balance between user acquisition, value creation, and monetization strategies across both sides of the platform (McIntyre & Srinivasan, 2017).

1.1.3. Business Model Innovation

In markets shaped by disruptive innovation and platform dynamics, the business model is a key determinant of whether disruptions succeed and incumbents are displaced (Huesig, 2012; Christensen et al., 2015). Since the rise of e-commerce in the mid-1990s, it has become a central concept in explaining why some companies succeed while others fail (Amit & Zott, 2001; Berger & Hess, 2015; Trabucchi et al., 2019). Over time, a wide range of business model definitions has emerged from different academic perspectives, including contributions by Stewart and Zhao (2000), Applegate and Collura (2001), Afuah and Tucci (2001), Osterwalder and Pigneur (2010), Weiner et al. (2010), Weill et al. (2011), Zott et al. (2011), and Bieger et al. (2011). Wirtz (2019) systematizes this diversity by comparing common definitions and highlighting their core elements. Despite some conceptual differences, most definitions agree that a business model describes how an organization creates value and generates revenue (Berger & Hess, 2015). In this

dissertation, I follow Osterwalder and Pigneur (2010, p. 14), who define a business model as “the rationale of how an organization creates, delivers, and captures value.”

Numerous approaches have been developed for designing, analyzing, and evaluating business models (Trabucchi et al., 2019). Among these, the Business Model Canvas by Osterwalder and Pigneur (2010) has become one of the most influential conceptual frameworks, offering a comprehensive, company-wide perspective (Khodaei & Ortt, 2019; Trabucchi et al., 2019). It structures the key strategic components of a company into nine interrelated building blocks (customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure), with the value propositions forming the core of the framework (Osterwalder & Pigneur, 2010).

When new technologies or markets emerge, customer needs are often unclear, and no business model can initially capture them comprehensively (Bohnsack et al., 2014; Teece, 2010). In these early stages, companies typically pursue different business models, which they iteratively adapt to better fit evolving customer needs and value networks (Chesbrough, 2010; Demil & Lecocq, 2010; Morris et al., 2005; Sosna et al., 2010; Teece, 2010).

Building on the growing interest in the development of business models, research on business model innovation has gained traction in recent years (Foss & Saebi, 2017; Zhao et al., 2020; Brem et al., 2016). However, the literature still lacks a clear consensus on what defines business model innovation. Foss and Saebi (2017) outline competing perspectives. While some authors argue that changes to a single building block may already qualify as a business model innovation, others contend that only modifications across all building blocks fulfill the criteria. Ramdani et al. (2019) further classify business model innovation into degrees of novelty, ranging from incremental adjustments to radical reconfigurations. Schallmo et al. (2021) emphasize the customer’s perspective as the primary lens for evaluating novelty. Innovation occurs when new combinations of components create previously unavailable value for customers or partners. In line with the definition of business models by Osterwalder and Pigneur (2010), business model innovation is about new ways of creating, delivering, and capturing value. Business

model innovation is not only shaped internally but is often driven by external factors such as technological advancements, regulatory requirements, and shifts in customer behavior (Bruhn & Hadwich, 2018; Wagner & Kabel, 2018; Nielsen, 2023).

1.1.4. Dominant Designs

As business models are continuously adapted to evolving market conditions and customer needs, structural convergence may occur. The concept of dominant designs explains how one configuration becomes the de facto standard within an industry. Originally developed in the context of product and technology innovation by Utterback and Abernathy (1975), it describes a process in which, after an initial phase of experimentation with competing designs, one configuration emerges that aligns with the needs of most market participants and becomes widely adopted across the industry (Morris et al., 2005; Ramin, 2017). The emergence of a dominant design marks a turning point for the industry, as it significantly influences innovation dynamics, technology life cycles, and strategic priorities (Srinivasan et al., 2006; Brem et al., 2016; Ramin, 2017). Before this turning point, (radical) product innovations have been predominant. Afterward, the innovation focus typically shifts toward efficiency-enhancing process innovations (Dodgson et al., 2013; Ramin, 2017), accompanied by increasing market concentration (Suárez & Utterback, 1995; Utterback & Abernathy, 1975) and declining innovative capacity (Brem et al., 2016).

While the dominant design concept was originally developed for product and technology innovations, several authors have extended it to the business model level, including Morris et al. (2005), Schallmo (2014), and Ramin (2017). In this context, a dominant business model refers to a structural configuration that sets the standard for how organizations create, deliver, and capture value. Once established, it is typically adopted by leading companies within an industry and serves as a benchmark for others, although alternative models may persist in niche markets (Morris et al., 2005; Schallmo, 2014; Ramin, 2017).

1.2. Overview of the Dissertation

In this section, I provide an overview of my dissertation. I first embed the three papers in the theoretical foundation, then summarize their structure and content, and finally describe the methodological approaches used in each paper.

1.2.1. Theoretical Foundation

In my dissertation, I investigate how a framework can be developed and applied to assess the disruptive potential of online lending marketplaces and how and why a dominant business model has emerged in this industry. To answer these overarching research questions, I draw on theories of disruptive innovation, digital two-sided platforms, business model innovation, and dominant designs.

The theory of disruptive innovation provides an overarching lens to understand how new entrants can challenge and potentially displace established market players. This is complemented by the concept of digital two-sided platforms, which explains how digital platforms such as online lending marketplaces mediate between distinct user groups, balance interests, and generate network effects that can accelerate disruption. These two perspectives form the basis for Paper 1, in which we develop, apply, and validate a method to assess the disruptive potential of digital two-sided platforms, using the case of online lending marketplaces in Germany. The paper addresses Research Gap 1: the lack of a validated framework for the ex-ante assessment of the disruptive potential in digital two-sided platforms. Accordingly, it answers Research Question 1: “How can a framework be developed and applied to assess the disruptive potential of online lending marketplaces?”

Building on this foundation, Papers 2 and 3 draw on concepts and frameworks of business model innovation and dominant designs to explain how the business models of online lending marketplaces evolve, how similarities and differences can be identified, and how structural convergence may lead to the emergence of dominant business model configurations across national and international contexts.

In Paper 2, we develop a theory on the emergence of a dominant business model among German online lending marketplaces. It addresses Research Gap 2: the lack of research

on business model development in the context of digital two-sided platforms, and Research Gap 3, the lack of research on dominant business model designs in regulated service industries. It contributes to Research Question 2: “How and why has a dominant business model emerged at online lending marketplaces?”

In Paper 3, we expand this analysis to an international perspective to examine whether the business models of market leaders in the UK, the USA, and Germany are converging toward internationally dominant business model components, particularly in terms of customer segments and value propositions. The paper further addresses Research Gaps 2 and 3. By analyzing business model development with a focus on selected components and examining how external drivers influence convergence processes across national markets, it contributes to and refines Research Question 2.

Figure 1 illustrates how the research gaps, research questions, and theoretical areas are connected to the three papers, including their national and international perspectives.

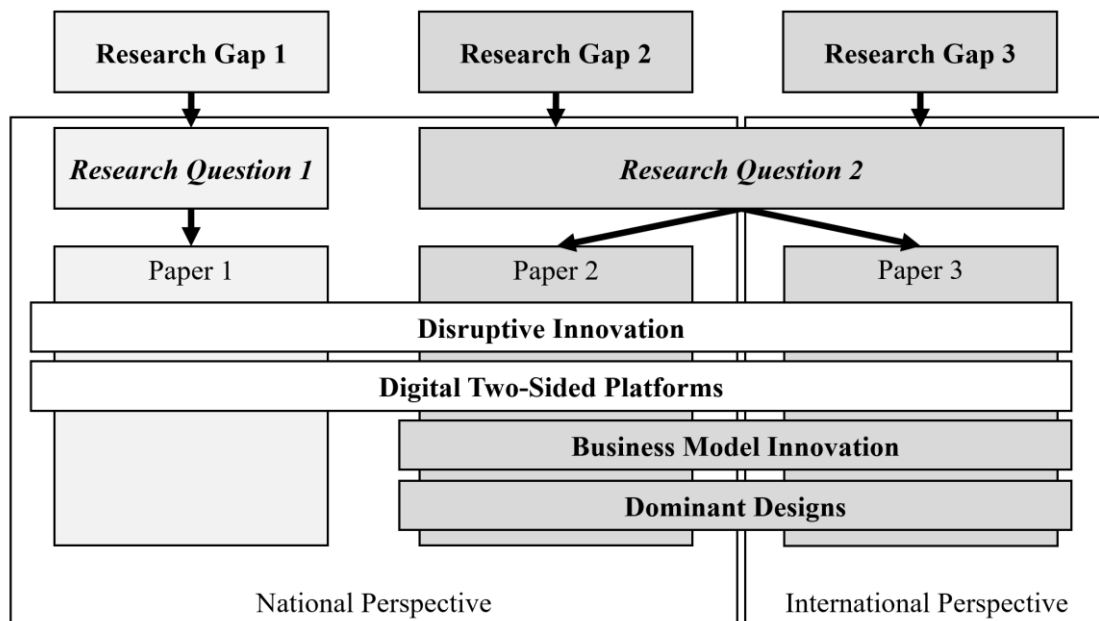


Figure 1: Theoretical Foundation of the Dissertation

1.2.2. Structure and Content of the Three Papers

Table 1 provides an overview of the essential elements of the three papers, which are explained in more detail below.

	Paper 1	Paper 2	Paper 3
Chapter	Chapter 2	Chapter 3	Chapter 4
Title	Application and Validation of a Disruptive Potential Methodology for Digital Two-Sided Platforms—the Case of Marketplace Lending in Germany	Towards a Theory on Dominant Business Model Emergence of Marketplace Lending in Germany	Drivers of International Convergence in Digital Two-Sided Platform Markets: The Case of Dominant Business Model Components in Online Lending
Authors	Sabine Pur Prof. Dr. Stefan Hüsigg Prof. Dr. Christoph Schmidhammer	Sabine Pur Prof. Dr. Stefan Hüsigg Prof. Dr. Christoph Schmidhammer	Sabine Pur Prof. Dr. Stefan Hüsigg Prof. Dr. Christoph Schmidhammer
Research Questions	Are and to what extent the properties of digital two-sided platforms considered in the frameworks for disruptive potential? How and why are frameworks for disruptive potential able to correctly predict the disruptive potential in the case of lending marketplaces for entrants and incumbents in the German banking industry?	How can the similarities and differences between the business models of the main German lending platforms be described? How and why could a dominant business model design among the lending platforms in Germany have emerged?	How and why do the business models of leading online lending marketplaces differ or converge toward a dominant design internationally or in their home markets?
Theory	Disruptive innovation Digital two-sided platforms	Disruptive innovation Digital two-sided platforms Business model innovation Dominant designs	Disruptive innovation Digital two-sided platforms Business model innovation Dominant designs
Methodology	<u>Qualitative:</u> Framework development based on literature review Case study at industry and company level	<u>Mixed methods:</u> Case study at company level Cross-case analysis Quantitative analysis of financial metrics	<u>Qualitative:</u> Case study at industry and company level Cross-case analysis
Data & Research Context	Secondary data from Germany's banking sector Research period: March 2007 to October 2015 (forecast), 2019 (validation)	Secondary data from Germany's main online lending marketplaces Research period: Founding to 2022 (qualitative), Founding to 2020 (quantitative)	Secondary data from online lending in the UK, the USA and Germany Research period: Founding to March 2024
Current Journal Status	<u>Published:</u> International Journal of Technology Management (VHB ¹ : C) DOI: 10.1504/IJTM.2022.121509	<u>Published:</u> Credit and Capital Markets – Kredit und Kapital (VHB ¹ : C) DOI: 10.3790/ccm.56.1.63	<u>Submitted:</u> Technovation (VHB ¹ : B) on June 11, 2025
Journal Development (formerly under review)	Technological Forecasting and Social Change (VHB ¹ : B) R&D Management (VHB ¹ : B)	Electronic Markets (VHB ¹ : B)	Research Policy (VHB ¹ : A)
Conferences	3rd ARTEM OCC 2020 (accepted ²) SMS 34th Annual Conference PICMET 2014	EURAM 2022 4th ARTEM OCC 2022	R&D Management 2024 EURAM 2024 (accepted) PICMET 2023

Table 1: Overview of the Three Papers

¹ The Verband der Hochschullehrer für Betriebswirtschaft e.V. (VHB) evaluates academic journals relevant to business research through the VHB Rating 2024, which consists of 18 subject-specific journal rankings. Source: <https://www.vhbonline.org/services/vhb-rating-2024>, accessed on May 24, 2025.

² Due to the corona pandemic, the conference was canceled by the organizer, but the paper is listed in the Book of Abstracts.

In the **first paper**, “Application and Validation of a Disruptive Potential Methodology for Digital Two-Sided Platforms—the Case of Marketplace Lending in Germany”, published in the double-blind, peer-reviewed journal “International Journal of Technology Management”, we investigated the disruptive potential of digital two-sided platforms using the example of online lending marketplaces in Germany. The objective was to develop, apply, and validate a framework for the ex-ante assessment of potentially disruptive innovations in digital two-sided platforms, addressing Research Gap 1. Based on a comprehensive literature analysis of existing frameworks, we built our approach on Keller and Huesig (2009) and extensions by Kaltenecker et al. (2013). Our developed framework enables the quantification of the disruptive potential of digital two-sided platforms as a general measure, separately for each disruption phase, for each market side, and for different market participants. It also considers network effects and the possible aggregation of heterogeneous companies on each market side. A case study based on Yin (2009) was chosen to apply and test this approach. The evaluation relied on expert triangulation and secondary data. After its initial application in 2015, subsequent market developments enabled an ex-post validation in 2019. The results show that the developed framework supports the accurate prediction of disruptive potential in the context of digital two-sided platforms.

In the **second paper**, “Towards a Theory on Dominant Business Model Emergence of Marketplace Lending in Germany”, published in the double-blind, peer-reviewed journal “Credit and Capital Markets – Kredit und Kapital”, we analyzed the development of the business models of the largest German online lending marketplaces smava, auxmoney, and Lendico. The objective was to examine whether a dominant design had emerged among their business models. This contributes to research on business model development in the context of digital two-sided platforms and to research on dominant business model designs in regulated service industries, addressing Research Gaps 2 and 3. To achieve this, we used a mixed-methods approach. First, a case study according to Yin (2009) and Eisenhardt and Graebner (2007) was conducted to analyze and compare the business models, with the Business Model Canvas by Osterwalder and Pigneur (2010) serving as the conceptual framework. Then, a quantitative analysis of the companies’

financial metrics according to Entrop et al. (2015), Granger (1969), and Bertrand et al. (2004) triangulated the qualitative findings. The data for both parts of the analysis consisted of secondary data from the three online lending marketplaces, covering the period from their founding until 2022 (qualitative) and 2020 (quantitative). The results of the mixed-methods analysis show that all three marketplaces pursued different business models and that no dominant business model has emerged among leading German online lending marketplaces, despite their initially similar approaches.

In the **third paper**, “Drivers of International Convergence in Digital Two-Sided Platform Markets: The Case of Dominant Business Model Components in Online Lending”, submitted to the double-blind, peer-reviewed journal “Technovation” on June 11, 2025, we examined the business model development of the respective market leaders in three countries (the UK: Funding Circle, the USA: LendingClub, and Germany: auxmoney), which represent early core markets of the online lending marketplace industry. The objective of this research was to examine whether internationally dominant business model components have emerged in this industry and to understand the external drivers that have shaped this convergence. Thus, the national perspective from Paper 2 was extended to an international context, and Research Gaps 2 and 3 were further addressed and refined. For this purpose, we conducted a case study analysis according to Yin (2009) and Eisenhardt and Graebner (2007) to examine and compare the institutional and market conditions as well as the business models of the respective national market leaders. Building on the results of the second paper, we used a theoretical framework to analyze and compare the business models, focusing on the building blocks “customer segments” and “value propositions” of the Business Model Canvas by Osterwalder and Pigneur (2010). Secondary data from the three online lending marketplaces, covering the period from their founding to March 2024, served as the basis for the analysis. The results show a strong convergence in these two components, indicating the emergence of internationally dominant business model at the component level. To explain this development, we developed a generic, process-oriented model that highlights the role of external drivers.

1.2.3. Methodology of the Three Papers

To answer the overarching research questions of my dissertation, we applied qualitative and quantitative research methods in the three papers. The qualitative case study approach according to Yin (2009) dominated in all papers. This approach is particularly suitable as it addresses “how” and “why” questions to analyze current phenomena (Benbasat et al., 1987; Yin, 2014). The case study approach makes it possible to examine phenomena in detail in their real-life context, to capture the dynamics in a specific setting, and to combine a variety of data collection methods and sources (Eisenhardt & Graebner, 2007; Yin, 2009). We triangulated data from different sources in each paper to ensure the validity, reliability, and credibility of the research technique and data quality (Huberman & Miles, 1994; Yin, 2009). To obtain feedback on the chosen research design and our research results, and to counteract researcher bias, the papers were presented and discussed at several peer-reviewed international conferences at various stages of development.

The research methods applied in each paper are outlined below. Detailed descriptions of the respective methodologies and research designs are provided in Section 2.3.1 for Paper 1, in Section 3.3.1 for Paper 2, and in Section 4.3 for Paper 3.

In **Paper 1**, we conducted a comprehensive literature review of frameworks for the ex-ante assessment of disruptive innovations. We analyzed the first 60 hits of a Google Scholar search using the keywords “ex-ante frameworks for disruptive innovation” and “disruptive potential forecasting”, complemented by other relevant studies from the literature. To reduce keyword bias, we additionally reviewed results for 45 commonly used terms in the literature. We focused exclusively on journal articles, excluding studies that lacked a forecasting method or provided an unclear definition of disruptive innovations. The remaining 26 articles were evaluated using key criteria particularly relevant for assessing the disruptive potential of digital two-sided platforms. Since no existing framework met all the required criteria, we modified the most suitable approach of Keller and Huesig (2009) along with extensions from Kaltenecker et al. (2013), making specific adaptations for digital two-sided platforms. We then applied our modified framework to the case of online lending marketplaces in Germany. We used an embedded

single-case study approach according to Yin (2009) from a forward-looking perspective at the industry and company level by aggregating and analyzing incumbents and entrants (smava and auxmoney) into homogeneous groups. The ex-ante case study was based on secondary data from March 2007 to October 2015, collected from company websites, scientific publications, and other publicly available sources. After assigning the data to the criteria defined in the framework, it was evaluated by a multidisciplinary panel of four experts. Their assessments were combined through expert triangulation and pattern matching until a shared view was reached. This procedure, supported by a traceable chain of evidence, helped ensure a high level of internal validity (Yin, 2009). The ex-post validation of the 2015 forecast was conducted in 2019 using secondary data, analyses, and an analogous evaluation procedure.

For **Paper 2**, we chose a mixed-methods approach. This approach allows the combination of the strengths of qualitative and quantitative methods to explore a complex topic from several perspectives and thus achieve more comprehensive and valid results (McKim, 2017). For the qualitative research, we applied a multiple case study according to Yin (2009) and a cross-case analysis according to Eisenhardt and Graebner (2007) at company level to analyze and compare the business models of the three largest German online lending marketplaces: smava, auxmoney, and Lendico. First, the marketplaces were examined in individual case studies and then compared in a cross-case analysis. The Business Model Canvas by Osterwalder and Pigneur (2010) served as the theoretical framework. Based on the qualitative results, we formulated a modified, testable hypothesis that was statistically tested in the quantitative analysis. This included a confirmatory descriptive analysis of the annual growth rates of total assets according to Entrop et al. (2015), whereby a significant outperformance by one business model would indicate a dominant design. Additionally, we used a Granger causality test (Granger, 1969) to assess whether the growth rates of one business model influence those of another. A unidirectional influence would indicate a dominant business model. Moreover, a difference-in-difference estimation according to Bertrand et al. (2004) was applied to analyze the effects of strategic adjustments to the business models over time. Such changes should result in stabilized or increased growth rates, which would indicate the presence of a dominant design. The secondary data for both parts of the analysis were

sourced from the Federal Gazette, annual reports, news archives on company websites, published interviews, and other publicly accessible sources. The investigation period extended from the founding of the online lending marketplaces to 2022 and was divided into segments. In the qualitative analysis of the individual cases, the business model development was analyzed from their founding to 2016, followed by a cross-case comparison of the individual business model components in 2016. Further business model developments from 2016 to 2022 were also analyzed and included in the discussion. The quantitative analysis covered the period from their founding to 2020.

In **Paper 3**, we applied a multiple case study according to Yin (2009) and a cross-case analysis according to Eisenhardt and Graebner (2007) at the industry and company level to examine the development of the business models of the leading online lending marketplaces in the UK (Funding Circle), the USA (LendingClub), and Germany (auxmoney). Initially, each national context was examined in an individual case study using a structured analysis. This included the institutional framework and lending landscape, the market situation and key players, and the business model development of the national market leaders. We assumed that changes in the business models would be reflected in the number of loans granted, either positively or negatively. We therefore compared the qualitative changes in the business models with the respective annual number of loans granted. In addition, we assumed that the market leaders would show increasing convergence in their business models at an international level over time as a result of adapting to increasingly clear and evolving customer needs. To verify this, the results were compared in a cross-case analysis to identify similarities and differences between the markets and business models and to detect indications of internationally dominant business model components. The conceptual framework for the empirical analysis of the business models was based on the two building blocks “customer segments” and “value propositions” of the Business Model Canvas by Osterwalder and Pigneur (2010). This focus reflects the results of Paper 2, which showed that companies in the same industry differ primarily in these building blocks. This approach is also supported by prior research, as these building blocks are the subject of the Value Proposition Canvas by Osterwalder et al. (2014) and are crucial for a product-market fit. Schallmo’s (2014) approach also emphasizes the importance of a customer-centric

perspective in analyzing and determining business model innovations and dominant business models. The secondary data analyzed were obtained from 236 sources, including annual reports, press releases, and blogs of online lending marketplaces, as well as other sources such as the Federal Gazette and published interviews with key players. The research period spanned from the founding of the analyzed marketplaces to March 2024.

After outlining the theoretical background and providing an overview of my dissertation in this introductory chapter, the three papers that form its core are presented in Chapters 2, 3, and 4. Due to the varying requirements of the journals to which the papers were submitted or in which they were published, the structure and formal aspects of the three papers in my dissertation differ slightly.

2. Paper 1: Application and Validation of a Disruptive Potential Methodology for Digital Two-Sided Platforms – the Case of Marketplace Lending in Germany

2.1. Motivation and Introduction

Since the appearance of disruptive innovation (DI) theory in 1997 (Christensen, 2017), new phenomena and concepts have emerged in the area of innovation, such as the platform economy or the sharing economy, (Belk, 2014; Botsman & Rogers, 2010; Eckhardt & Bardhi, 2015; Kenney & Zysman, 2015; Venkatraman et al., 2014). These new economic or business models (BMs) were enabled through digitalisation – with the increased potential of information technology being used to transform analogue BMs into digital ones (Clemons et al., 2017; Nambisan et al., 2017). These new BMs are often implemented on digital platforms with the nature of two-sided or multi-sided markets (Clauss et al., 2019). They are characterised by two different user groups with different network effects, which increase their complexity (Parker & van Alstyne, 2005). In this case, the success of a BM is particularly dependent on the number of users on the other side, as the different customer segments are connected and interact with each other. Thus, two-sided market platforms seem to be more often associated with disruptive phenomena and BMs (Trabucchi et al., 2019). For this reason, these BMs are particularly dangerous for established companies that serve only one side of the two-sided market in their standard BM. They are sneakily confronted with competition from another complementary market and the network effects prevailing there, but they seldom notice this in time, do not adequately assess it, and, accordingly, act too late (Zhu and Furr, 2016; Furr, 2016). A lot of research has been undertaken in recent years to understand and analyse various BMs on platforms – mostly of a general nature (Taeuscher & Laudien, 2018; Gatautis, 2017), sometimes in the context of DI (Habtay & Holmén, 2014; Shaughnessy, 2016; Zhang et al., 2018; Ozalp et al., 2018; Sampere, 2016), but rarely in the forecasting perspective of the disruptive potential (DP). While the DP-construct has gained in popularity (Huesig et al., 2005; Habtay, 2012), for the analysis of DP on two-sided platforms, researchers need to take into account that both sides of a digital platform

could exhibit different levels of DP. An increasingly growing scholar base is conducting research into the general topic of DI, though mostly from the ex-post perspective. However, an ex-ante analysis is of crucial importance for incumbents to be able to react to potential disruptive innovations (PDI) at an early stage, as well as for entrants to develop the PDI as effectively as possible. As Søren Kierkegaard concedes: “It is perfectly true, as philosophers say, that life must be understood backwards. But they forget the other proposition, that it must be lived forwards.” Although research on DI theory has been conducted more recently from an ex-ante perspective, an evaluated methodical framework for an improved prescriptive capability, particularly in the digital platform economy, remains largely absent (Christensen et al., 2018). The link between BM analysis in two-sided markets and the prediction of DP thus remains insufficiently explored. Therefore, we address the question of whether and to what extent these new properties of digital platforms need to be considered in the analysis of the overall DP. In addition to the type of innovation, the reactions also depend on the design of the BM of the respective company. For this reason, it is also precisely the heterogeneity of incumbents in the face of potential disruption that must be taken into account, which increases the complexity of the ex-ante analysis and has not been adequately addressed in existing approaches (Kammerlander et al., 2018; Madjdi & Huesig, 2011; Hابتay, 2012; Hابتay & Holmén, 2014). Thus, we respond to the call of scholars such as Danneels (2004, 2006), Kaltenecker et al. (2013), Christensen (2006), and Christensen et al. (2004) for more ex-ante studies to test and further develop the DI theory by better understanding its potential boundary conditions. Finally, we share the view of Funk (2017) who suggests that assessing public forecasts helps to encourage accountability since public forecasts of technology in general and in DI specifically are rarely assessed and continue to have a poor reputation. Theory that is not able to predict anything is useless at the end of the day.

In our search for a suitable case, we identified a potential disruptive phenomenon in the banking industry that fits to our desire to validate an ex-ante disruption method: the emerging peer-to-peer (p2p) lending marketplaces in the retail banking business. Since the onset of the financial and banking crisis in 2007, banks have faced ever-expanding challenges. Regulation and subsidy, continuing low interest rates, and rising costs are just some of the consequences banks have to deal with. Government bailouts, financial fraud,

unethical banking practices, lack of transparency, and the sovereign debt crisis also motivated the bank customers to avoid established intermediaries such as banks or government agencies (Frerichs & Schuhmann, 2008). This loss of customer confidence fuelled increasing interest in new lending and investment opportunities or alternative financial institutions (Vater et al., 2012). In addition, the so-called Web 2.0 has been changing the internet economy since 2005 (O'Reilly, 2005). Individuals have become more and more used to playing a part in the dissemination of information and direct digital interaction. Bank customers are also open to an increasing user-centric digitisation of banking operations, but traditional banks are usually slow to follow. These trends appear to have fuelled the growth of p2p marketplace lending, which offers transparent online-based investments and the granting of credits between individuals. They have emerged as an alternative, having been established first in the UK with Zopa in 2005 and in Germany with platforms such as smava or auxmoney from 2007 onwards. In the first study period until 2015, the marketplaces examined were pure p2p loans. In the meantime, however, an increasing number of institutional investors and (small) enterprises have also begun taking out loans there, so the term marketplace lending is more commonly used. The two terms are often used synonymously. The loans considered in this paper are pure p2p loans. Owing to the different aspects of a DI, (p2p) marketplace lending could have high DP for established banks. With their initially poorer product characteristics, measured against the current industry standard, (p2p) lending marketplaces address the lower segments of the established market and other customer groups that are new or unknown to the banks. From the point of view of the established companies, the entrants' BM seems initially unprofitable and uninteresting.

In order to address these research and application challenges, we identified and further developed the DP framework from Keller and Huesig (2009) with extensions from Kaltenecker et al. (2013) following a systematic and comprehensive literature analysis of major theories and frameworks on ex-ante DP frameworks and applied it to the case of marketplace lending in 2015 as an illustrative, applicative, and prospective case study based on secondary data analysis. We followed a case study approach since our cases take place within a real-life context, combine numerous data collection methods and sources, and tend to focus on an in-depth understanding of the dynamics in a single setting (Yin,

2009; Eisenhardt & Graebner, 2007). Furthermore, illustrative case studies provide an empirical exemplar of the embodiment of the particular theory, method, or categorisations and show how it can be used in practice (Scapens, 2004). Four years later, in 2019, we are reviewing our findings and predictions to validate the forecasting quality and to further develop the method. Figure 2 illustrates the process of developing the DP framework for digital two-sided markets.

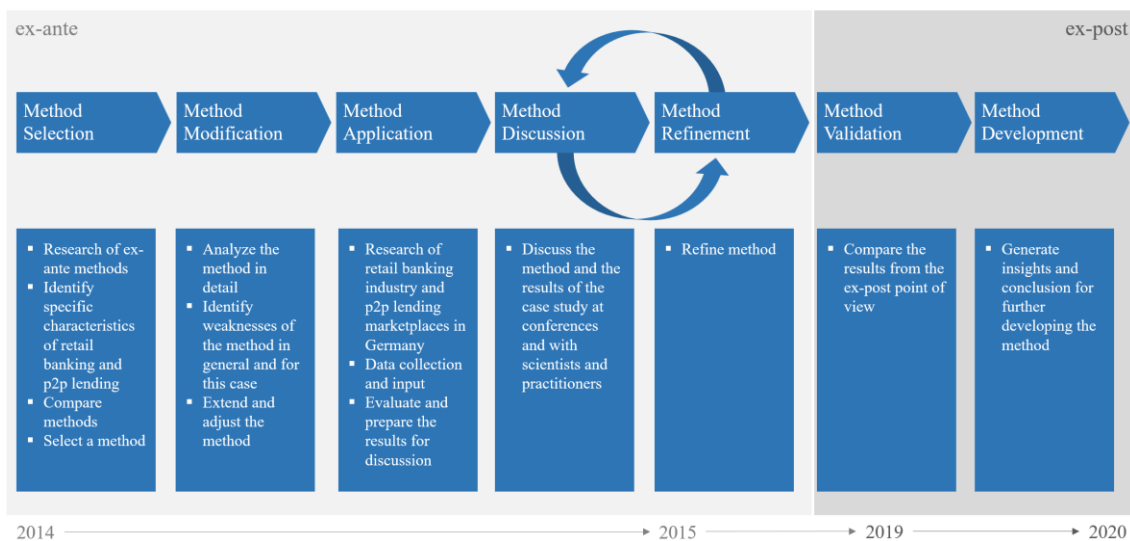


Figure 2: Process of Developing the DP Framework for Digital Two-Sided Markets

In addition, the response strategies of the incumbents can be identified and included in the ex-post data analysis, as suggested by Christensen et al. (2018).

We will investigate the following research questions in this paper:

1. Are and to what extent the properties of digital two-sided platforms considered in the frameworks for DP?
2. How and why are frameworks for DP able to correctly predict the DP in the case of lending marketplaces for entrants and incumbents in the German banking industry?

To answer the research questions, we first provide a brief overview of the DI theory, thereby paying particular attention to DP assessment. We then choose and modify a method for the ex-ante prediction of DI for the case of digital two-sided platforms and to

answer research question 1. Next, we present our application of the modified framework and the results of the DP in the case of marketplace lending in Germany from the viewpoint of 2015. These results are compared with the DP of the same case in 2019. In doing so, we aim to evaluate the predictions of 2015 and the ex-ante framework itself, which enables us to answer research question 2. This is followed by a discussion of the results along with implications for marketplace lending and the retail banking sector in Germany. We close our paper with conclusions for the method development and the theory of disruption, potential limitations of the study, and further research options.

2.2. Theoretical Background

2.2.1. The Theory of DI

Christensen and Raynor (2003) refer to two basic forms of innovation: sustaining and disruptive. A sustaining innovation improves the known and relevant properties of existing products for typical mainstream customers. This can be a small improvement as well as a completely new development (Keller & Huesig, 2009). In contrast, a DI provides a new set of features, performance attributes, and/or price characteristics compared to those of existing products. The DI typically sneaks up on an existing business and threatens to replace it (Rafii & Kampas, 2002). Disruption is thus a new process of goods and services in which customer expectations and competition switch to new performance attributes such as simplicity, convenience, or accessibility – mostly at a lower price (Anthony et al., 2008).

The theory of DI distinguishes two ideally-typical firm types: the incumbent and the entrant. The incumbent is an established company that is, before the emergence of a DI, already a competitor in the researched industry with ‘old’ well-tried products, technologies and/or BMs (Christensen & Raynor, 2003). Having acquired a significant market share over the years, the incumbent continues to develop its existing product and service range to serve the attractive mainstream customers in the upper market segments.

In the process, however, the incumbent fails to make use of disruptive opportunities for itself, which typically emerge at the low-end of the mainstream market or in a completely new market (Christensen et al., 2004; Grill & Perczynski, 2007). In the course of a DI,

the incumbent often loses its established position in the market and is sometimes forced to give it up entirely (Christensen et al., 2004). The entrant, in contrast, is the company that enters the mainstream market with the emerging DI (Christensen & Raynor, 2003). As an attacker free of past success and organisational constraints related to this market, the entrant is able to seize disruptive opportunities (Tushman & Anderson, 1986); however, it is not necessarily a startup (Yu & Hang, 2010) but a smaller company with fewer resources (Christensen et al., 2015). A successful entrant often comes from another industry and has the required resources and skills for successfully implementing the DI or the disruptive BM (Helfat & Lieberman, 2002). The entrant brings to the market a product that is initially relatively 'poor' compared to the quality of the products normally found in that market. Initially, it addresses customers at the lower end of this market or in another market and offers a 'simpler' product that is fully sufficient for this customer group. From the incumbent's point of view, this customer group is not profitable at this time. The entrant steadily improves its offer until the performance attributes are considered good enough for the customers in the mainstream market as well (Christensen et al., 2004; Christensen, 2006).

Christensen et al. (2004) distinguishes three states of need satisfaction among the different customer groups. Undershot customers are those customers whose requirements for the traditional performance attributes are not being met sufficiently. They are buying the existing product but are not completely satisfied and desire improvements for which they are willing to pay more (Christensen & Raynor, 2003; Christensen et al., 2004). As the incumbent continuously launches further performance improvements to serve this group of customers, a growing number of customers is more than satisfied, the so-called overshot customers. Existing products are more than good enough for them. They no longer use them in their entirety and are not willing to pay for further improvements. These types of customers are inclined to switch to offers that they consider to be better value for money. They are offered a product that can do less, but is sufficient for them, and even significantly cheaper. As a result, the required price premiums for next generation products can hardly be earned (Christensen et al., 2004; Anthony et al., 2008). The final group is the non-consumers, who do not or hardly consume the existing products

due, for example, to a lack of access, knowledge, or assets. They are not or are rarely customers of the incumbent (Christensen et al., 2004).

How a company identifies and satisfies their customers' needs determines its so-called value network. This has a close impact on how companies evaluate the economic value of a DI. The BM of the company defines how this is accomplished (Christensen, 1997; Keller & Huesig, 2009).

Depending on the market entry of the entrant, Christensen et al. (2004) differentiate between low-end DI and new market DI. Low-end DI applies to the most unprofitable customers of the incumbent in the lower market segment of its (old) value network, the overshot customers. An indication of this may be the entrant's BM, which allows it to generate sales and profits in a (completely) new way compared to the incumbents (Christensen et al., 2004). The incumbents often do not view the entrants with a low-end DI as a threat because they lose (almost) no or few sales due to the migration of less profitable customers at the beginning (G. M. Schmidt & Druehl, 2008). Moreover, the incumbent usually assumes that the DI will never be competitive in the main market (Henderson, 2006). The new market DI, however, appeals to the non-consumers and serves a new value network in which the customers have different needs (Christensen & Raynor, 2003). With its simplicity, affordability, and accessibility, it offers an alternative to the established products and often solves unresolved problems with existing offerings in the market as a result of the new and different performance attributes. In the value network of the incumbent, the new solution is comparatively inferior to the old one in terms of the characteristics that are considered important. Over the course of time, the quality of the new market DI offer will improve so that it also meets the quality requirements of the overshot customers in the lower market segment of the established market and they can migrate to the new value network. It is particularly difficult to identify this form of DI early on because the incumbent does not take note of another potential customer group in another market or hardly loses its own customers at the beginning. Moreover many disruptions represent a hybrid form that may include aspects of both categories (Christensen & Raynor, 2003; Christensen et al., 2004).

It is extremely important for new entrants to decide which strategy to adopt when entering the market. It is most promising for it to choose or build a new value network independent of that of the incumbents. The incumbent fails because it is unable to change its strategy towards the new value network without deducting resources from the ever more profitable old value network. It would be relatively easy for it to react appropriately if the value networks possessed a strong overlap. This could be caused by bottlenecks, e.g., monopolies of suppliers or distributors, and would affect the cost structure and the BM of the entrant significantly (Christensen et al., 2004; Huesig et al., 2005). In addition, a strong dependence on a venture capital investor could cause problems for an entrant. The main reason for this is that investors often demand quick results, whereas patience on their part would be more beneficial for the entrant's business because a DI needs time to grow. In addition, certain market conditions may hinder a promising DI. This might be the case if the undershot segment is not big enough for the entrant to grow into the main market. The incumbent, on the other hand, tries to deny the market entry because it depends on the low-end segments, for example, for covering high fixed costs, and therefore it notices a low-end DI early (Christensen et al., 2004).

In the context of DI, one additional concept is known to be essential for the success of a disruption and the failure of the incumbent: the BM (Christensen et al., 2015; Huesig, 2012). Notwithstanding that the BM aspect has previously been addressed by Christensen et al. (2004), research, e.g., by Johnson et al. (2008) and Markides (2006), among others, has focused more on the business model innovation (BMI) aspect, i.e., how to change or innovate a consisting BM, in connection with disruptive change. There are various definitions of BMs in the literature. Osterwalder and Pigneur (2010) define a BM as the rationale of how an organisation creates, delivers, and captures values. Thus, BMI is about new ways of creating, delivering, and capturing value.

Established companies will not succeed with DI unless they understand how the potentially disruptive opportunity correlates to their current BM and how to handle it accordingly (Christensen et al., 2015; Johnson et al., 2008). The resource-processes-values framework provides a deeper understanding of the DI theory (Christensen & Raynor, 2003). This approach explains why the incumbents usually succeed in

implementing sustaining innovations: they are in line with the existing resources, processes, and values (or priorities) in contrast to the DI. The entrant may use the opportunity to develop new processes and cost structures with the DI that are difficult for the incumbent to respond to (Christensen et al., 2004). The issue lies in the fact that the old BM is not oriented towards DI and that changing the BM so that it is geared towards DI requires the development of new processes and priorities (Christensen et al., 2016). This basic difficulty is also explained and underlined by the value network approach. If the incumbent tries to implement a DI with old resources, processes, and values, it will usually fail (Charitou & Markides, 2003).

2.2.2. The Ex-Ante Analysis of DI

2.2.2.1. Concept and Method of Ex-Ante Identification: the DP

Since the disruption process takes time, an innovation is not normally disruptive in the short-term (Christensen et al., 2015). The development usually extends over a very long period of time, and the incumbents do not feel much pressure to react. By then, it is often too late to react adequately because the entrants have already acquired new skills unknown to the incumbent that are crucial for success in the changed value network. This demonstrates the need for early identification of a DI (Bower & Christensen, 1995; Christensen et al., 2004).

For this reason, the concept of DP was developed. It is supposed to be a tool for the ex-ante analysis of innovations that could be disruptive in the long-term as well as of PDI (Huesig et al., 2005; Keller & Huesig, 2009; Lim & Anderson, 2016; Rafii & Kampas, 2002; Habtay, 2012). It indicates the potential of an innovation by the threat it poses to incumbents to ultimately fail. Or restated positively, it indicates the potential of an innovation by the opportunity it grants to entrants in an existing or emerging value network to ultimately succeed against the previously dominant incumbents. These approaches seek to identify the DP of an innovation by measuring it along a set of criteria that are based on Christensen's disruption theory. The degree of DP is often measured by the relative amount of disruptive characteristics fulfilled. A disruption can only occur if the new technology is capable of meeting the performance demanded in the mainstream

market (Christensen, 1997). The result of the analysis of the DP gives an indication of how threatening the PDI is or will be at a given time since the disruption phenomenon is typically a long-term process that can be divided into different phases (Christensen et al., 2004). As long as the disruption process is not completed, the monitored innovations might have different degrees of DP, but the outcome remains unclear until the end.

Various scholars have conducted research in the DI context (Christensen et al., 2018). In our search of a forecasting approach suitable for this case, we conducted a comprehensive literature review – both for the period of the first survey and forecast (up to 2015) and up to the validation (2019). This involved using a Google Scholar search to analyse the top 60 hits for the keywords ex-ante frameworks for DI and DP forecasting and other studies cited in the related literature, excluding them for DI in the absence of a forecasting method or an unclear DI definition and application. Moreover, we only focused on journal papers. This sample of 26 studies was evaluated according to the following key criteria: forecasting tool for already implemented PDIs, separate forecast for incumbents and entrants, consideration of the temporal development/phases of DI, inclusion of network effects, inclusions of specifics in two-/multi-sided markets and validated method.

Finally, in both 2015 and 2019, there were few frameworks that we could partially apply and modify to our case. Table 2 provides an overview of different frameworks for ex-ante identification and their conformity with the above-mentioned key criteria.

Year	Author	Description	Forecasting tool for already implemented PDIs	Separate forecast for incumbents & entrants	Consideration of the temporal development/ phases of DI	Inclusion of network effects	Inclusion of specifics in two-/multi-sided markets	Validated method
2002	Christensen et al., 2002	- Two general strategies for turning ideas into plans for disruptive growth companies: * Creating a new market as the basis for disruption * Disrupting the business model from the low end - Testing ideas against litmus tests with DI-specific questions for disruptive business model strategy - Guide to creating your own DI or growth companies from a management and enterprise level perspective	-	-	-	-	-	-
2002	Rafii and Kampas, 2002	- Management guide from a corporate perspective for identifying and assessing specific competitive threats, formulating responses, and allocating resources. - Can also be used by entrants as a strategy tool - Two components: * Analytical tool: 6 phases of the disruption process, each with influencing factors identified by the company (as a team), assessed on a 7-point scale and weighted using a 3-point scale * Organizational process: six-step process for applying the analytical tool in the company	+	-	+	-	-	-
2004	Christensen et al., 2004	- Three-step process using questions from DI literature to predict industrial change: * Identify signals * Assess competitors * Choose strategy	+	-	-	-	-	-
2004	Sainino, 2004	- Framework with six propositions, for analyzing the impact of a new, potentially disruptive technology on a company's business model - Five propositions with predetermined DI-specific questions to assess two mediating variables: Disruptive potential of the technology and strategic importance of the technology to a company - Sixth proposition determines the changes in the company's business model: customer interface, core strategy, strategic resources, and value network - Answering the questions in group discussions with experts in two groups - Management tool for knowledge-intensive industries, less so for traditional industries	+	-	-	-	-	-
2005	Huesig et al., 2005	- Enterprise view: guide for managers to make ex-ante distinctions between DT and other phenomena caused by emerging technologies. - Orientation to the management process for DT: 1. DT scanning, 2. develop opportunities and BM, 3. execute—use principles of DT - Focus on 1.: Guided expert interviews based on qualitative and quantitative questions from DT research and for trajectory mapping	+	-	-	+	-	+
2006	Govindarajan and Kopal, 2006	- Management tool to position incumbents, capabilities or competencies at the organizational level to best introduce DI compared to other companies. - Use ex-post measures of disruptiveness to make ex-ante predictions - Five-item scale to measure disruptiveness of innovations with 13 items in a three-factor structure (radicality, disruptiveness, competence-disruptiveness)	+	-	-	-	-	-

Table 2: Frameworks for the Ex-Ante Identification of DI and/or DT

Year	Author	Description	Forecasting tool for already implemented PDIs	Separate forecast for incumbents & entrants	Consideration of the temporal development/ phases of DI	Inclusion of network effects	Inclusion of specifics in two-/multi-sided markets	Validated method
2007	Sainio and Puumalainen, 2007	- Framework that combines technology analysis with a holistic view of the company's operations - Interpretation of the disruption potential of a new technology and its impact on the company's operations - Qualitative multiple case study of the ICT industry - Group discussions of five propositions with representatives from research and development of established companies	+	-	-	-	-	-
2008	Schmidt and Druehl, 2008	- Three-stage framework with linear reservation pricing model to identify PDI in low-end or high-end segment and diffusion patterns: * High-end encroachment * Fringe-market low-end encroachment * detached-market low-end encroachment * immediate low-end encroachment. - Management guidance from a corporate perspective	-	-	+	-	-	-
2008	Anthony et al., 2008	- Management guide for existing companies that want to develop new business areas - Use of various tools and methods: * Identifying opportunities with an alternative view of potential customers/markets * Developing ideas and strategies in the early stages and under great uncertainty * Building businesses with appropriate strategies and managing teams * Creating capabilities with the necessary structures, processes, and metrics	-	-	-	-	-	-
2009	Keller and Huesig, 2009	- Framework for analyzing, evaluating, and forecasting PDI in the software industry - Combination of different ex-ante frameworks, enriched with network effects and trajectory mapping - List of criteria (twelve criteria for the entrant, ten criteria for the incumbent—in three phases each) indicating a disruptive innovation, and trajectories for the performance characteristics and prices of the technologies	+	+	+	+	-	+
2011	Hang et al., 2011	- Framework of structured questions that can be used to guide the detailed data collection and analysis needed to answer the key questions in the assessment framework - Areas: * Market position * Technology * Other favorable drivers - Evaluate the potential for success of disruptive innovations in low-end or new markets - No focus on challenges in ex-ante prediction - Can only possibly be used as a concrete forecasting tool in further development	+	-	-	+	-	-
2011	Chandra and Yang, 2011	- Framework explaining DI as a co-evolutionary entrepreneurial process at the firm, product, and customer levels and various drivers therein - Management guide for creating and managing DI	+	-	-	-	-	-

Table 2: Frameworks for the Ex-Ante Identification of DI and/or DT (continued)

Year	Author	Description	Forecasting tool for already implemented PDIs	Separate forecast for incumbents & entrants	Consideration of the temporal development/ phases of DI	Inclusion of network effects	Inclusion of specifics in two-/multi-sided markets	Validated method
2011	Sood and Tellis, 2011	<ul style="list-style-type: none"> - Scheme with definitions and distinction between types of technology, types of attack, and domains of disruption. - Derivation of seven hypotheses: three about technological entry and four about the threat of disruption - Test the hypotheses with a correlated-hazards model and calculate firm and technology disruption using time-related factors and exogenous covariates for platform technologies - Out-of-the-sample prediction: Jackknife approach, for determining the out-of-sample predictive validity of the hazard model 	+	-	-	-	-	-
2013	Klenner et al., 2013	<ul style="list-style-type: none"> - Analysis of market readiness for potential market entry and successful market exploitation of disruptive innovations. - Assessment of the "disruptive susceptibility" of value networks prior to the introduction of a new technology on the basis of 14 conceptual propositions—pure demand perspective - Forecasting and evaluation tool or early warning system for established companies 	-	-	-	-	-	-
2013	Hardman et al., 2013	<ul style="list-style-type: none"> - Three-point criterion to identify DT: disruptive to market leaders, disruptive to end users, disruptive to infrastructure—two of the three must be met at a minimum - Emerged from analysis of seven historical cases and identification of seven common characteristics of disruptive technologies - Serves ex-post analysis and ex-ante prediction at market entry and at market penetration - Method for developers of DT and of market leaders 	+	-	+	+	-	-
2014	Hahn et al., 2014	<ul style="list-style-type: none"> - Analysis of startups using the AngelList platform metrics and evaluation of the disruptiveness of the value propositions using the disrupt-o-meter proposed by Anthony et al. (2008). - Nine evaluation criteria and eight classifications of startups' value propositions in relation to their market offerings - Empirical support for conceptualizing the disruptiveness of the value proposition as a metric for evaluating the business potential of new technology startups 	+	-	-	-	-	-
2015	Mathew, 2015	<ul style="list-style-type: none"> - Framework with 5 questions to determine DP of Telsa: <ul style="list-style-type: none"> * Does it target overshot customer and/or non-consumer? * Does it create asymmetric motivation of entrant and incumbents? * Does it create rapid performance improvement with no change in cost structure? * Does it create new value networks? * Does it disrupt all incumbents or can one use it as an opportunity? 	+	-	-	-	-	-
2016	dos Santos Paulino and Le Hir, 2016	<ul style="list-style-type: none"> - Identify PDI based on ten characteristics of a DI when it is introduced to the market and before it becomes widespread - Perspectives: technology, demand, threat - Case: individual high-tech product in bilateral oligopoly market 	+	-	-	-	-	-

Table 2: Frameworks for the Ex-Ante Identification of DI and/or DT (continued)

Year	Author	Description	Forecasting tool for already implemented PDIs	Separate forecast for incumbents & entrants	Consideration of the temporal development/ phases of DI	Inclusion of network effects	Inclusion of specifics in two-/multi-sided markets	Validated method
2016	Dijk et al., 2016	- Define and test six (nested) hypotheses on when market disruption is likely to succeed: * three address the changes in the key framing of the innovation * three address the key drivers of innovation dynamic	+	-	-	-	-	-
2016	Nagy et al., 2016	- Expanded definition of DI with the innovation characteristics of functionality, technical standards, and ownership - Three-step method for predicting whether an innovation could be potentially disruptive to a company: Identification of the innovation and its characteristics, identification of the use of the innovation - Within the organization's value chain, comparison of PDI with existing technologies in that value chain segment - Explanation of why PDI is disruptive for some companies and not for others	+	-	-	-	-	-
2016	Lim and Anderson, 2016	- Approach to mapping technology trajectories using data envelopment analysis (DEA), which examines patterns of technological progress from multidimensional perspectives - Consideration of alternative technologies that have disruptive potential in terms of emerging performance measures - Considering multiple attributes of technology systems and addressing various trade-offs between technology attributes, through weight constraints in the DEA model - Measuring levels of technology capabilities, to identify low-end and high-end disruptive potentials	+	-	-	-	-	-
2016	Chen et al., 2016	- Framework for quantitative assessment of potential disruptive technologies with focus on timing of disruptions: * Conquest of new market (D-Day) * Conquest of mainstream market (V-Day) * Early setback in closing performance and utility gaps (bleak days) - Supporting decision makers to structure and analyze available information in six steps to identify the right approach for planning new products and innovations	-	-	+	-	-	-
2017	Dotsika and Watkins, 2017	- Framework for maturity of disruptive trends and to help predict emerging technologies with disruptive potential. - Keyword network analysis and visualization approach to uncover emergent thematic, structural, and temporal developments using bibliographic data from scientific and business publications	+	-	-	-	-	-
2017	Cheng et al., 2017	- Empirical study to identify potential application areas for disruptive technologies using Derwent patent data. - Implementation and modification of a SIRS epidemic model using RFID technology patent data: * deterministic for short-term forecast of potential industrial and technological disruption, and * stochastic for long-term forecast of major disruptive technology outbreak in candidate application areas. - Tool for companies and other stakeholders to better forecast future disruptive technology trends and assess the potential of disruptive technology	-	-	+	-	-	-

Table 2: Frameworks for the Ex-Ante Identification of DI and/or DT (continued)

Year	Author	Description	Forecasting tool for already implemented PDIs	Separate forecast for incumbents & entrants	Consideration of the temporal development/ phases of DI	Inclusion of network effects	Inclusion of specifics in two-/multi-sided markets	Validated method
2018	Rasool et al., 2018	- Five-step framework for developing own DI and identifying PDI of others. - Focus on product innovation - Time of idea generation/evaluation is product development (without customer or market data)	-	-	-	-	-	-
2019	Guo et al., 2019	- Multidimensional quantitative measurement framework for assessing the disruptive potential of product innovation and insights for product launch and resource allocation decisions. - Ten indicators in three domains: technological characteristics, market dynamics, and external environment—but excludes technological progress and the mainstream market - Weights of indicators according to their connectivity with other indicators (score assigned by subjects)	+	-	-	-	-	-

Table 2: Frameworks for the Ex-Ante Identification of DI and/or DT (continued)

For the analysis of the DP of two-sided digital platforms, none of the frameworks shown in Table 2 satisfy all of our required key criteria. For this reason, an extension of the existing theoretical approaches and methods is necessary. For our method modification, we built on the most appropriate framework according to our criteria explained above. It appears that the DP framework developed by Keller and Huesig (2009) with the extensions suggested by Kaltenecker et al. (2013) based on an initial validation is most appropriate. However, we augmented this framework with some of our own developments for two-sided digital platforms, which will be elaborated in the following.

The DP framework of Keller and Huesig (2009) is based on a catalogue of criteria rooted in DI theory and aspects relevant for the internet economy, such as network effects, which are explicitly taken into account. We also follow Keller and Huesig (2009) with their structuring of the disruption process into three phases, which shows the dynamics of the disruption process and possible variations of the DP in each phase. Furthermore, we adopt the modified approach of Kaltenecker et al. (2013) because it is based on an ex-post validation of the Keller and Huesig framework. However, we remove the criterion ‘coordination costs are low’ from the original framework on the established side because it does not seem relevant in our application field of digital platforms.

We found further possibilities for improvement and therefore made the following modifications to the framework: First, in the main market entry phase on the entrant side, the factor ‘products are based on standard components’ was redundant to the ‘resource aspect’. Second, we also include external resources such as licenses or permissions to operate a business by regulation that are externally influenced in this criterion as suggested by Huesig et al. (2005). Thus, we combined both aspects under the ‘strategic resources are accessible’ criterion, which addresses potential resource-specific showstoppers. Furthermore, we have missed one relevant aspect on the incumbent side in the discussion of disruptive threats: some companies have had experience in successfully dealing with a disruptive threat while others did not [‘disruptive black belt’, as Christensen et al. (2004) call it]. For this reason, we have added the missing aspect on the incumbent side (‘incumbent has no experience in successfully dealing with disruptive threat’).

Finally, to analyse the DP of digital platforms, another important extension is necessary. Digital platforms are often characterised as so-called ‘two-sided markets’ because of their positive externalities on both market sides (Kenney & Zysman, 2015; Parker & van Alstyne, 2005; Rochet & Tirole, 2003; Venkatraman et al., 2014). Platforms in two-sided markets have at least two different groups with different network effects. In the case of so-called cross-side network effects, an increasing number of users on one side of the network make it more or less valuable for the user on the other side. Therefore, inter alia, search costs can be reduced, alternative or complementary products and services emerge, and the choice of transaction partners increases (Boudreau & Jeppesen, 2015; Rochet & Tirole, 2003). In the case of same-side network effects, an increasing number of users on one side of the network make it more or less valuable to users on the same side (Parker & van Alstyne, 2005). We assume that two-sided platforms can have different BM variations on each side. Characterised by the presence of at least two distinct sides whose ultimate benefit stems from interacting through a common platform, the owners of such platforms have to deal with the ‘chicken-egg-problem’ to get both sides on board. Platforms often treat one side as a BM can only achieve effective operations on such a platform if both sides receive the same attention. We propose that there could be differences in the degree of the DP on the different sides of the platform and, as a result, in the overall BM. Until now, this aspect in particular has not been covered in academic literature at all, though Christensen and Raynor (2003) do mention examples of ‘disruptive’ firms with two-sided platform-models, such as eBay or Google. The consideration of a two-sided market platform leads us to double the modified Keller-Huesig-framework in order to capture the DP of both sides. The resulting method modification is shown in Table 3.

Phase	Market side 1		Market side 2	
	Entrant	Incumbent	Entrant	Incumbent
Foothold market entry	<ul style="list-style-type: none"> • Products perform worse based on established attributes • Products are cheaper, simpler, more comfortable, or more reliable • Products address current non-consumers • Profitable BM targeting over-satisfied customers • Investors allow experimentation 	<ul style="list-style-type: none"> • Some customers are over-satisfied • Main customer segment does not appreciate entrant's products • Market for products based on PDI appears small and irrelevant 	<ul style="list-style-type: none"> • Products perform worse based on established attributes • Products are cheaper, simpler, more comfortable, or more reliable • Products address current non-consumers • Profitable BM targeting over-satisfied customers • Investors allow experimentation 	<ul style="list-style-type: none"> • Some customers are over-satisfied • Main customer segment does not appreciate entrant's products • Market for products based on PDI appears small and irrelevant
Main market entry	<ul style="list-style-type: none"> • Strategic resources (licenses, capital, etc.) are accessible • Network for PDI is expected to be large • PDI is compatible with existing network 	<ul style="list-style-type: none"> • Established performance attributes are shifting • Customers are unwilling to pay for further improvements along established attributes • Switching costs are low • Incumbent has no experience in successfully dealing with disruptive threat 	<ul style="list-style-type: none"> • Strategic resources (licenses, capital, etc.) are accessible • Network for PDI is expected to be large • PDI is compatible with existing network 	<ul style="list-style-type: none"> • Established performance attributes are shifting • Customers are unwilling to pay for further improvements along established attributes • Switching costs are low • Incumbent has no experience in successfully dealing with disruptive threat
Failure of the incumbent	<ul style="list-style-type: none"> • BM is significantly different • Processes are significantly different • Value network has a low overlap 	<ul style="list-style-type: none"> • Products matching entrant's offer are not offered • Incumbent is fleeing to premium customer segments • PDI is not implemented in separate organization 	<ul style="list-style-type: none"> • BM is significantly different • Processes are significantly different • Value network has a low overlap 	<ul style="list-style-type: none"> • Products matching entrant's offer are not offered • Incumbent is fleeing to premium customer segments • PDI is not implemented in separate organization

Table 3: Criteria to Analyze the DP of a Digital Two-Sided Platform

2.2.2.2. Operationalisation of the DP of Digital Two-Sided Platforms

In order to cover the DP of a digital two-sided platform holistically and differentiatedly, we evaluate the two market sides as well as the three phases in the disruption process, both market participant groups from the point of view of DI theory (entrants and established companies) as well as individual companies or companies clustered according to similar BMs. This approach increases the complexity of the analysis. In order to support the interpretation of the results and to simplify the application of the method, we suggest quantifying the DP as a further step towards an operationalisation of the concept.

Therefore, all criteria of our framework (Table 3) have been formulated as disruption-positive, i.e., if the criterion is fulfilled, a disruption is more likely to occur. In order to measure the DP, we focus initially on each market side separately, where all criteria (for all phases, all groups, and all BMs) have to be evaluated first. Following this, all criteria with the classification ‘fulfilled’ are accumulated for each phase. By doing so, the DP of each phase results in a numerical value as well as a percentage rate. The values of all phases are then added up to yield the total DP per market side as percentage rate. For consolidation purposes, the arithmetic average of both market sides has to be calculated. The outcome is an aggregated numerical value of all criteria that expresses the total DP in sum as percentage rate.

For illustration purposes, we formalise the approach as follows.

The DP is measured by qualitatively assessing the criteria of the three disruption phases:

x_i criteria of “foothold market entry,”

y_j criteria of “main market entry,” and

z_k criteria of “failure of incumbent,” where

$$index \begin{cases} i= 1, \dots, l \\ j= 1, \dots, m \\ k= 1, \dots, n \end{cases}$$

and

$$x_i, y_j, z_k = \begin{cases} 1, & \text{if a criterion is fulfilled} \\ 0, & \text{else.} \end{cases}$$

In the case of ‘else’, a criterion may also be not fulfilled or rated as unknown. For reasons of clarity, the following formulae focus on fulfilment of criterion as a percentage rate. Similarly, the DP was also determined for ‘not fulfilled’ and ‘unknown’.

For each phase, we calculate the DP as a percentage rate of fulfilment.

$$DP^x = 100 \cdot \frac{1}{l} \cdot \sum_i^l x_i,$$

$$DP^y = 100 \cdot \frac{1}{m} \cdot \sum_j^m y_j$$

and

$$DP^z = 100 \cdot \frac{1}{n} \cdot \sum_k^n z_k.$$

Additionally, we illustrate the DP of all three phases as a percentage rate. The general formula of DP is calculated as follows:

$$DP = 100 \cdot \frac{1}{l+m+n} \cdot \left[\sum_i^l x_i + \sum_j^m y_j + \sum_k^n z_k \right].$$

We measure the DP for

- BM types c (e.g., entrants separately assessed, incumbents clustered in homogenous groups)
- aggregated by market side b
- aggregated by market participant groups a (entrants and incumbents).

Therefore we apply the following indices for DP, where

$$index \begin{cases} c = 1, \dots, f \\ b = 1, \dots, e \\ a = 1, \dots, d \end{cases}$$

For DP, the lowest level of aggregation is for BM types c . In order to account for different levels of aggregation, we denominate the general formula DP as $DP_{a,b,c}$, which means that the DP of BM c that is part of market side b and market participant group a is measured. Hence,

$$DP_{a,b,c} = 100 \cdot \frac{1}{l+m+n} \cdot \left[\sum_i^l x_{a,b,c,i} + \sum_j^m y_{a,b,c,j} + \sum_k^l z_{a,b,c,k} \right]$$

Aggregating $DP_{a,b,c}$ by BMs c for each market side b results in $DP_{a,b}$, which is calculated as follows:

$$DP_{a,b} = 100 \cdot \frac{1}{f} \cdot \sum_c^f DP_{a,b,c}$$

In order to aggregate $DP_{a,b}$ by market sides b , we calculate:

$$DP_a = 100 \cdot \frac{1}{e} \cdot \sum_b^e DP_{a,b}$$

The highest level of aggregation is denominated as DP^{total} , which is the average percentage of market participants a (entrants and incumbents):

$$DP^{total} = 100 \cdot \frac{1}{d} \cdot \sum_a^d DP_a$$

However, the DP values of each phase per market side are also significant since each phase represents a certain state of the DI process, which provides various response options to alter the DP of later stages. Therefore, we analogously apply aggregation levels for the phases of DP, e.g., $DP^x_{a,b,c}$, $DP^x_{a,b}$ or DP^x_a for further argumentation. It can also be very useful and valuable to compare individual DP values with each other.

The resulting DP values need to be evaluated using an evaluation scale appropriate to their consistency or degree of pattern matching with the underlying theoretical framework. Our DP evaluation scale (Table 4) is supposed to increase transparency and objectivity in the evaluation of DP.

DP value (%)	DP pattern matching
0%	no DP—no pattern match
> 0% - ≤ 33.33%	low DP
> 33.33% - ≤ 66.66%	average DP
> 66.66% - < 100%	high DP
100%	full DP—full pattern match

Table 4: DP Evaluation Scale

2.3. Application of the Modified Ex-Ante Framework for DP in the Case of Marketplace Lending in Germany

2.3.1. Research Strategy and Data for the Ex-Ante Approach

We illustrate and apply our modified approach to the case marketplace lending in Germany. For this purpose, an illustrative, applicative, and prospective case study was designed on a firm and industry level. Typically, case studies take place within a real-life context, combine numerous data collection methods and sources, and tend to focus on an in-depth understanding of the dynamics in a single setting (Eisenhardt & Graebner, 2007; Yin, 2009). In addition, data triangulation emphasises the reliability and validity of qualitative research (Yin, 2009). Furthermore, illustrative case studies provide an empirical exemplar of the embodiment of particular theory, method, or categorisations and show how it can be used in practice (Scapens, 2004).

For our purpose, we modified the case study method and followed the research approach of Christensen et al. (2004), Keller and Huesig (2009), Klenner et al. (2013) and Kaltenecker et al. (2013), who all propose that case studies be used as a forward-looking method. The ex-ante case study was based on self-collected secondary data and secondary analyses from March 2007 until October 2015 that were publicly available on firm

websites or in other media and scholarly publications. This data was analysed, and a multidisciplinary expert panel evaluated the criteria. This panel consisted of four experts with diverse backgrounds in research and consulting, and in technology, innovation, finance, and banking. Their evaluations were integrated by means of expert triangulation and by pattern matching to establish a chain of evidence until a common view was reached, thereby ensuring high internal validity (Yin, 2009).

In order to gain a comprehensive overview of the research approach, Figure 3 displays the structure of the six-step process followed. Steps 1 to 4 include the research for the ex-ante forecast of 2015. Steps 5 and 6 deal with the ex-post validation of the framework in 2019.

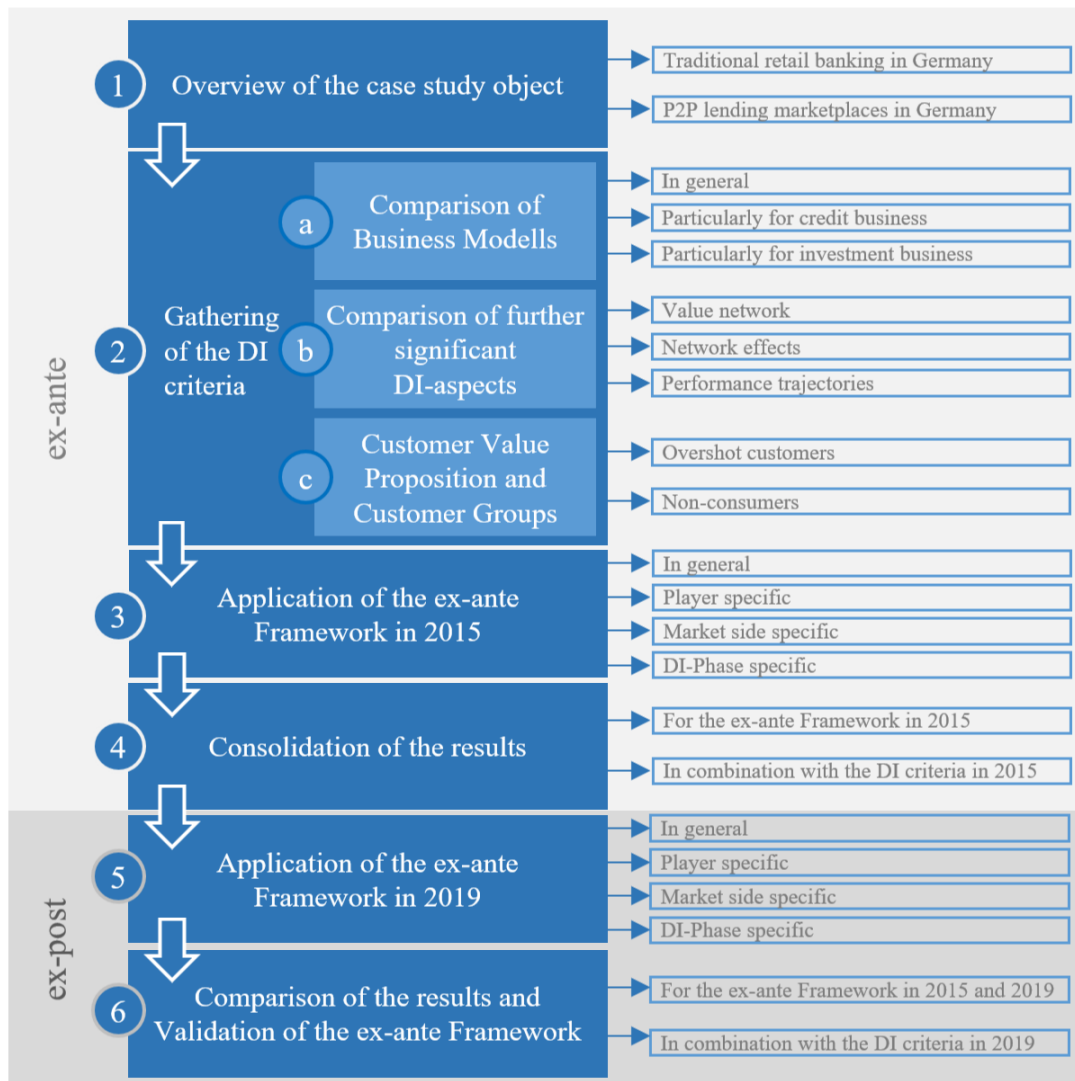


Figure 3: Structure of the Six-Step Process of the Study

2.3.2. Overview of Incumbent German Banking Sector and Entrant Marketplace Lending Platforms

For analysing the DP of marketplace lending for the incumbent German banking industry, a basic understanding of traditional banking services is required. Marketplace lending platforms target segments and customers in the traditional retail banking sector. Therefore, we focus on this sector for our analysis. This sector usually conducts highly standardised business with private customers as well as with smaller business and corporate customers.

In these segments, the investments are generally not very individualised, and the credit volumes are relatively small. At the product level, payments, loans, insurance, investments, and securities can be distinguished (Bartmann et al., 2013). For two-sided market aspects, the investment and the credit business have to be considered separately (Belleflamme et al., 2015; Bundesregierung, 2010).

From the retail banks' point of view, two **investment** product groups have the highest relevance: First, the banks' proprietary retail products, especially all bank savings products, are directly used for the bank's refinancing as these funds remain in the institution. Second, banks generate major revenues through acting as an intermediary between customers and third-party product issuers, particularly the securities business. The spectrum of the investment alternatives differs greatly according to their risk-return profile (Tolkmitt, 2007).

In the **credit business**, the bank allocates financial assets for a certain credit period to a borrower who continuously pays interest – the interest income from the credit facility is still one of the main sources of income for banks (Grill & Perczynski, 2007). Furthermore, the borrower guarantees repayment and sometimes even grants rights to information and participation. The area of credit financing can be further defined according to these criteria: term, credit type, use and type of collateral (Tolkmitt, 2007). Retail credits mainly include overdrafts, consumer credits, and mortgage loans, and are widely standardised (Grill & Perczynski, 2007). Flexibility in retail credits typically comes with a significant

price premium that often more than doubles the interest rates per year for overdrafts in contrast to a classic ‘offline’ consumer credit.

A **retail credit** is usually a classic consumer credit paid by instalments. Besides a one-time processing fee at the beginning, a fixed interest rate is charged that is usually extrapolated over the entire credit period and repaid along with the credit amount in equal instalments, so-called annuities (Grill & Perczynski, 2007). Information asymmetries between lenders and borrowers, the time gap between performance and remuneration, and decisions made under uncertainty affect the lending business. According to the principal-agent theory, the agent (borrower) has an information advantage over the principal (lender) (Ross, 1973). The client has provided his service (payment of the loan amount) and can only partially influence the return (timely instalment payments). The borrower could therefore succumb to the incentive, e.g., to choose a riskier alternative than originally agreed with the lender, because it promises him higher profits or an advantage (‘moral hazard’). Therefore, there is an incentive to present one’s own ability and willingness to repay the loan as better than in reality. The management of this risk and the different incentives defines a core problem of the credit business that should be addressed and resolved by means of a preliminary credit assessment (Tolkmitt, 2007).

Besides idiosyncratic risk, which relates to individuals or companies, banking institutions face **systematic risk**, which became well known during the financial crisis from 2007–2009. Both factors significantly influence the risk of a credit portfolio as, for example, described in Gordy (2000). In order to sustain the stability of the financial sector, supervisors and banking authorities have developed rules relating to risk and capital. Consequently, capital standards are defined by the Basel Committee on Banking Supervision (BCBS), which have most recently been revised in the light of the financial crisis. BCBS standards are implemented into European legislation via Capital Requirements Regulation (CRR) (EUR-Lex, 2013) and Capital Requirements Directive (CRD IV) (EUR-Lex, 2006a, 2006b). National jurisdictions implemented European standards on January 1, 2014. Taking into account different capital buffers, e.g., the capital conservation buffer and the countercyclical buffer, minimum capital requirements can reach up to 13% relative to risk weighted assets. Since investors require an adequate

return for equity, minimum capital requirements – which cannot be invested in risky assets – have to be taken into account in the calculation of a borrower's interest rate. Since capital requirements address banking institutions and not individuals, such costs do not occur for marketplace lenders.

Entrants in this market with their marketplace lending platforms provide an electronic marketplace for p2p credits, sometimes also referred to as lending-based crowdfunding platform (Belleflamme et al., 2015; Faßbender, 2012). A p2p credit is seen as a loan that is mediated between a (private) borrower and one or more investors through an online marketplace (O. Johnen & Goebel, 2010). As p2p credit marketplaces are usually not required to hold a banking license, they work together with transaction banks to process the transactions (in the German case).

This business involves various aspects of innovation. In terms of product innovation, marketplace loans are a new asset class for individuals that were previously inaccessible and comparable to a personal loan. In addition, marketplace lending can be seen as a process innovation in two respects. On the one hand, as online lending by private individuals, where investors actively and collectively decide which loan to finance. On the other hand, a process innovation of the traditional Loan Provision Technology (LPT) is taking place here. Marketplace-lending-LPT is used on digital lending marketplaces. This is a process in which information about the solvency of borrowers and investor capital is converted into marketplace loans. When marketplace lending began, the risk could only be insufficiently assessed by the individual lenders. Changes in this process and further developments, such as marketplace-lending-LPT-specific ratings (e.g., 'auxmoney Score'), contributed to a potentially more consistent assessment of the risk. However, marketplace-lending-LPT-specific ratings increasingly left less scope for the credit assessment of individual lenders. This increased automation of the process speeds up the granting of loans. As a result, marketplace-lending-LPTs tend to be simpler, initially less accurate, more transparent, and potentially cheaper – up to 60% is expected – and faster than the LPTs of established banks (Lendacademy, 2014). Furthermore, a collective funding (crowdfunding/sourcing) reduces potential capital costs for the intermediary and spreads the risks for the lenders.

After marketplace lending had initially established itself in the UK with Zopa in 2005 (Faßbender, 2012; O. Johnen & Goebel, 2010; Zopa, 2015), serious marketplace lending in Germany began in March 2007 with the activities of smava and auxmoney. In addition to these, less serious agents for initiating personal loans such as eLolly, Money4friends, or other platforms were also represented on the German market (Bundesregierung, 2010; Hildebrandt-Woeckel, 2009; Raake & Hilker, 2010). In 2015, there was still a great diversity within the group of commercial marketplace loans in Germany and other providers with comparable BMs such as Giromatch, Crosslend, Lendico or Funding Circle (formerly Zencap). This is due to different characteristics of the individual components or aspects of the platforms (Heng et al., 2007; Meyer, 2009). However, the marketplace lending platforms have one thing in common: the default risk ultimately remains with the lender and not with the operator (Mitschke, 2007). In addition, however, there is a major advantage for the borrower: a deposit of collateral is not required for marketplace loans (Barasinska et al., 2011).

In this research context, disruption is seen as relative to existing BMs (Christensen et al., 2004). The BMs of the entrants are often heterogeneous in the early phases of the disruption process (Huesig, 2012). But the incumbents must also be considered more closely in this respect. In order to address the heterogeneity of BMs, we initially generated three types of incumbent BMs (Table 5) and analysed the individual BMs of entrants under the assumption that the BMs of the incumbents are relatively homogenous within their group.

	Major banks	Savings & cooperative banks	Direct banks
Biggest companies	Deutsche Bank, Commerzbank	Sparkassen, Volks- & Raiffeisenbanken	ING-DiBa, DKB
BM	Branch operations and personal customer service	Branch operations and personal customer service	Direct distribution without a branch system
Importance of retail banking	Medium	High	Very high

Table 5: Incumbent Groups in German Banking Market

2.3.3. Analysis of the DP of Lending Platforms for the Retail Banking Sector in Germany in 2015 and in 2019

2.3.3.1. Comparison of Lending Platforms and Traditional Banks on Both Market Sides of the BM

As lending platforms are two-sided markets with positive externalities on both sides – investment and lending – it is also necessary to take a close look at both sides of the platforms and the respective markets in the established business. In the traditional banking business, the established companies have authority, and the market rules are determined by their assumed high level of knowledge. Aspects such as security, trust, and tradition speak in favour of the traditional banking business. In contrast, marketplace lending processes are transparent and participative, giving users greater control and individual autonomy over their transactions (Hulme & Wright, 2006). In addition, person-to-person transactions on marketplace lending platforms also enjoy the general advantages of internet and online processing, such as simplicity, speed, and transparency offered by marketplace-lending-LPT (Liebetau, 2008). A comparison of the generalized BMs of marketplace lending platforms and traditional banks is provided in Table 6.

	Traditional retail banking	Marketplace lending platforms
Business type	Full banking license	Startup without a full banking license A transaction bank for backend processes necessary (in Germany)
Distribution	Branch operations, personal customer service, and online	Online platform
Revenue sources	Fees and interest	Fees
Lot-size transformation	Bundling small investments in larger amounts of credit	Automated bundling of small-scale systems to individual loan (crowd funding)
Term transformation	Give long-term short-term deposits	Term agreement
Risk transformation	Experienced banks assess risks and diversify	Risk diversification and evaluation is usually supported by operators

Table 6: BMs of Traditional Retail Banking and Marketplace Lending Platforms

- **BM on the investment market side:** The analysis of investment business is complicated due to the different investment products. Investing in marketplace loans enables private lenders to access a new asset class that was previously only accessible for institutional investors. The assets in this class have a high diversity in terms of risk and return (Liebetrau, 2008). The p2p credit facility is classified between fixed deposits and bonds. In addition, p2p investors are often also motivated by social or ethically-oriented investment targets and willing to forego financial return or to accept a higher risk. Nevertheless, they want to be compensated by a social return as reward, which they generate by providing capital for other individuals that need it the most (Hulme & Wright, 2006). Thus p2p lending offers a traditional investment business and if desired by the individual investor, a social investment as well. In the settlement process and the fee structure, no fundamental differences can be identified between the two models (Liebetrau, 2008; Stern, 2011). However, the toll-free option of early repayment and detachment of the p2p marketplace loans, of which considerable use is made, poses a reinvestment risk for investors because they have to find a new investment object (Meyer, 2009). An overview of our findings is provided in Table 7. The table shows both the values collected in 2015 and those collected in 2019.

	Traditional retail banking	Marketplace lending platforms	
Return	Dependent on product selection; only financial return	smava: 2015: Financial and social return 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Financial and social return
Amount	Unbounded	smava: 2015: Max. EUR 100,000 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Unbounded
Costs	Fees and provisions; mostly fixed fees at beginning of investment and ongoing management fees	smava: 2015: One-off fee as a percentage of the investment amount plus monthly ongoing fees 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: One-off fee as a percentage of the investment amount
Security	Bank and deposit protection	smava: 2015: Pools of investors and further risk minimization through proof of income of the borrower and SCHUFA query 2019: Marketplace lending discontinued	auxmoney: 2015: Residual debt insurance (optional) and further risk minimization through personal information of the borrower and auxmoney-Score 2019: Residual debt insurance (optional) and further risk minimization through certified borrowers and auxmoney-Score
Liquidity	Depends on product selection	smava: 2015: Low, no resale of the credit claim possible, but installments 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Low, no resale of the credit claim possible, but installments
Further		smava: 2015: Reinvestment risk in case of early redemption of the total loan 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Reinvestment risk in case of early redemption of the total loan

Table 7: BMs of Traditional Retail Banking and Marketplace Lending Platforms on the Investment Market Side

- BMs on the credit market side:** A key difference on the credit business side is that p2p loans do not require any collateralisation. In addition, the less stringent requirements for borrowers increase the likelihood of obtaining a loan. An overview of further findings is provided in Table 8 and discussed in more detail in the subsequent analysis of the DP. This table also shows both the values collected in 2015 and the values collected in 2019. The lack of regulatory minimum capital requirements for p2p credits could significantly contribute to increasing its DP. This is especially the case when the technical rating standards of p2p lending platforms are equal to those of traditional banks in the uncollateralised lending sector.

	Traditional retail banking	Marketplace lending platforms	
Allocation	Bank manager and policies	smava: 2015: Preliminary investigation by platform, investors 2019: Marketplace lending discontinued	auxmoney: 2015: Preliminary investigation by platform, investors 2019: Preliminary investigation by platform, investors, Portfolio-Builder
Amount	Upper limit depends on load capacity (e.g., budget account, credit scoring)	smava: 2015: max. EUR 50,000 2019: Marketplace lending discontinued	auxmoney: 2015: max. EUR 25,000 2019: max. EUR 50,000
Costs for the borrower	Processing fee, interest, partly credit insurance, cross-selling of inferior banking and insurance products, minimum capital requirements	smava: 2015: Mediation fee, interests, fee for statement of account if needed 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Mediation fee, interest, monthly service fee
Security requirements	Mostly required collateral	smava: 2015: Unsecured 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Unsecured, optional automotive certificate (car valuation)
Risk of loss	Bank	smava: 2015: Investors 2019: Marketplace lending discontinued	auxmoney: 2015 & 2019: Investors

Table 8: BMs of Traditional Retail Banking and Marketplace Lending Platforms on the Credit Market Side

2.3.3.2. Application of the Ex-Ante Framework and Consolidation of the Results: the DP in 2015

Having gained an overview of the case study object and gathered different DI criteria (as seen in Figure 3), we applied the generated knowledge to the ex-ante framework of our case of marketplace lending in Germany in 2015. We filled the framework with data using secondary data sources, evaluated them together with a panel of experts from the fields of technology, innovation, finance, and banking, and then held discussions at several conferences to refine our method (as illustrated in Figure 2). The result was the following DP values (in percent), as shown in Table 9. They were each qualitatively assessed using DP pattern matching according to Table 4. In addition to the values of 2015, Table 9 contains the updated values for 2019 using the same procedure; the changes are marked with arrows and highlighted values that are discussed in the next section on the validation of the framework.

Considering the different phases of the DI process and the market relevance of the topic in 2015, the lending marketplaces were in the initial phase of their expansion at this time. The details of the analysis related to that point of time and were possibly subject to future changes. The evaluations of the later phases of the DI process in particular have a prospective character and are very much directed towards the future. Their consistency and validity depend heavily on the reactions of the incumbents and the possible misdevelopment or failure of the entrants in the interim period. In the following remarks about the DP, we focus primarily on the striking differences and key aspects in the evaluated criteria of the investigated single companies and aggregated groups.

		Investment market side			Credit market side			Both market sides			
		Fulfilled	Not fulfilled*	Unknown*	Fulfilled	Not fulfilled*	Unknown*	Fulfilled	Not fulfilled*	Unknown*	
Foothold market entry phase: DP^x_{a,b,c}											
Entrants	smava	2015	20%	40%	40%	60%	0%	40%	40%	20%	40%
		2019	-	-	-	-	-	-	-	-	-
	auxmoney	2015	40%	0%	60%	80%	0%	20%	60%	0%	40%
		2019	40%	↑ 20%	↓ 40%	80%	0%	20%	60%	↑ 10%	↓ 30%
Entrants cum.		2015	30%	20%	50%	70%	0%	30%	50%	10%	40%
		2019	↑ 40%	20%	↓ 40%	↑ 80%	0%	↓ 20%	↑ 60%	10%	↓ 30%
Incumbents	Branch banks	2015	100%	0%	0%	100%	0%	0%	100%	0%	0%
		2019	100%	0%	0%	100%	0%	0%	100%	0%	0%
	Direct banks	2015	25%	25%	50%	75%	25%	0%	50%	25%	25%
		2019	↓ 0%	↑ 75%	↓ 25%	↓ 50%	↑ 50%	0%	↓ 25%	↑ 63%	↓ 13%
Incumbents cum.		2015	63%	13%	25%	88%	13%	0%	75%	13%	13%
		2019	↓ 50%	↑ 38%	↓ 13%	↓ 75%	↑ 25%	0%	↓ 63%	↑ 31%	↓ 6%
In General: DP^x_a		2015	46%	16%	38%	79%	6%	15%	63%	11%	26%
		2019	↓ 45%	↑ 29%	↓ 26%	↓ 78%	↑ 13%	↓ 10%	↓ 61%	↑ 21%	↓ 18%
Main market entry phase: DP^y_{a,b,c}											
Entrants	smava	2015	67%	33%	0%	100%	0%	0%	83%	17%	0%
		2019	-	-	-	-	-	-	-	-	-
	auxmoney	2015	100%	0%	0%	67%	0%	33%	83%	0%	17%
		2019	100%	0%	0%	↑ 100%	0%	↓ 0%	↑ 100%	0%	↓ 0%
Entrants cum.		2015	83%	17%	0%	83%	0%	17%	83%	8%	8%
		2019	↑ 100%	↓ 0%	0%	↑ 100%	0%	↓ 0%	↑ 100%	↓ 0%	↓ 0%
Incumbents	Branch banks	2015	0%	100%	0%	25%	75%	0%	13%	88%	0%
		2019	0%	100%	0%	25%	75%	0%	13%	88%	0%
	Direct banks	2015	25%	75%	0%	75%	25%	0%	50%	50%	0%
		2019	25%	75%	0%	75%	25%	0%	50%	50%	0%
Incumbents cum.		2015	13%	88%	0%	50%	50%	0%	31%	69%	0%
		2019	13%	88%	0%	50%	50%	0%	31%	69%	0%
In General: DP^y_a		2015	48%	52%	0%	67%	25%	8%	57%	39%	4%
		2019	↑ 56%	↓ 44%	0%	↑ 75%	25%	↓ 0%	↑ 66%	↓ 34%	↓ 0%

Legend:

↑ Increase of DP from 2015 to 2019

↓ Decrease of DP from 2015 to 2019

■ Values from which the changes originate and which arithmetically affect the other changes in the table

Table 9: Application of the DP Framework in 2015 and 2019

		Investment market side			Credit market side			Both market sides			
		Fulfilled	Not fulfilled*	Unknown*	Fulfilled	Not fulfilled*	Unknown*	Fulfilled	Not fulfilled*	Unknown*	
Failure of the incumbent phase: DP_{a,b,c}											
Entrants	smava	2015	0%	0%	100%	67%	33%	0%	33%	17%	50%
		2019	-	-	-	-	-	-	-	-	-
	auxmoney	2015	0%	0%	100%	100%	0%	0%	50%	0%	50%
		2019	↑ 33%	↑ 33%	↓ 33%	↓ 67%	↑ 33%	0%	50%	↑ 33%	↓ 17%
Entrants cum.		2015	0%	0%	100%	83%	17%	0%	42%	8%	50%
		2019	↑ 33%	↑ 33%	↓ 33%	↓ 67%	↑ 33%	0%	↑ 50%	↑ 33%	↓ 17%
Incumbents	Branch banks	2015	33%	33%	33%	67%	33%	0%	50%	33%	17%
		2019	33%	33%	33%	67%	33%	0%	50%	33%	17%
	Direct banks	2015	33%	33%	33%	67%	33%	0%	50%	33%	17%
		2019	33%	33%	33%	67%	33%	0%	50%	33%	17%
Incumbents cum.		2015	33%	33%	33%	67%	33%	0%	50%	33%	17%
		2019	33%	33%	33%	67%	33%	0%	50%	33%	17%
In General: DP_a		2015	17%	17%	67%	75%	25%	0%	46%	21%	33%
		2019	↑ 33%	↑ 33%	↓ 33%	↓ 67%	↑ 33%	0%	↑ 50%	↑ 33%	↓ 17%
DP through all phases: DP_a											
Entrants	smava	2015	27%	27%	45%	73%	9%	18%	50%	18%	32%
		2019	-	-	-	-	-	-	-	-	-
	auxmoney	2015	45%	0%	55%	82%	0%	18%	64%	0%	36%
		2019	↑ 55%	↑ 18%	↓ 27%	82%	↑ 9%	↓ 9%	↑ 68%	↑ 14%	↓ 18%
Entrants cum.		2015	36%	14%	50%	77%	5%	18%	57%	9%	34%
		2019	↑ 55%	↑ 18%	↓ 27%	↑ 82%	↑ 9%	↓ 9%	↑ 68%	↑ 14%	↓ 18%
Incumbents	Branch banks	2015	45%	45%	9%	64%	36%	0%	55%	41%	5%
		2019	45%	45%	9%	64%	36%	0%	55%	41%	5%
	Direct banks	2015	27%	45%	27%	73%	27%	0%	50%	36%	14%
		2019	↓ 18%	↑ 64%	↓ 18%	↓ 64%	↑ 36%	0%	↓ 41%	↑ 50%	↓ 9%
Incumbents cum.		2015	36%	45%	18%	68%	32%	0%	52%	39%	9%
		2019	↓ 32%	↑ 55%	↓ 14%	↓ 64%	↑ 36%	0%	↓ 48%	↑ 45%	↓ 7%
In General: DP_a		2015	36%	30%	34%	73%	18%	9%	55%	24%	22%
		2019	↑ 43%	↑ 36%	↓ 20%	73%	↑ 23%	↓ 5%	↑ 58%	↑ 30%	↓ 13%

Legend:

↑ Increase of DP from 2015 to 2019

↓ Decrease of DP from 2015 to 2019

■ Values from which the changes originate and which arithmetically affect the other changes in the table

Table 9: Application of the DP Framework in 2015 and 2019 (continued)

In 2015, entrants showed an average DP of 36% across all phases on the **investment market side**. However, a closer look reveals a mixed picture. Throughout all phases, auxmoney showed an average DP of 45% and a higher DP than smava, which had a low DP of 27%. At the foothold market entry phase, this was caused by the inferior product performance of auxmoney (average DP of 40%) compared with smava (with a low DP of 20%), e.g., no investor-pooling. For both entrants, however, there was a positive performance trend in attributes such as reliable credit checks and the upper-limit of maximum loan amounts per person improved and this development was forecast to continue. For the main market entry phase of auxmoney, a very high DP of 100% was forecast due to its compatibility with the traditional banking value network, because an existing bank account could be used for transactions, which makes it easier for potential customers to switch; this was in contrast to smava, where an extra bank account must be opened for investment. This resulted in a high DP of 67% at smava. At that time, no valid prognosis could be made for the failure of the incumbent phase, which is reflected by the fact that 100% of the criteria in the phase were assessed as unknown. On the **credit market side**, both entrants had a high DP for almost all criteria, with 77% on average through all phases. However, there were divergent findings, e.g., in the foothold market entry phase, smava had an average DP of 60% and auxmoney had a high DP of 80% due to their heterogeneous BMs. auxmoney, as far as it was publicly known, already had a profitable BM which cannot be assumed with certainty for smava. Smava's offers (e.g., credit periods) were continuously improved and still had potential for further improvements along the established performance characteristics, which could not be observed and clearly evaluated at auxmoney at that time. However, a stronger growth trend in the amount of loans also pointed to a further development of the product range. This was regarded as an important development up to the main market entry phase and is reflected here in a full DP of 100% at smava and a high DP of 67% at auxmoney, though, the overlapping of smava's value network was higher than that of auxmoney because of its loan broker role to banks. This made it easier for the incumbents to respond to the PDI and affected the failure of the incumbent phase. For this reason, smava, with a high DP of 67%, still had a lower DP here than auxmoney, which had a full DP of 100%.

In order to consolidate the entrants' evaluations, we aggregated smava's and auxmoney's results to a combined analysis. We consolidated the results by each aspect by calculating the arithmetic average for both companies. For the aggregated entrants, an average DP of 57% through all phases and for **both market sides** resulted. However, the two market sides (credit and investment) presented a mixed picture: Our analysis showed a high DP on the **credit market side** with 77% and an average DP of 36% on the **investment market side**. Marketplace lending offered borrowers a new possibility to gain access to an attractive loan with high flexibility, especially at the low-end and for non-customers who were formerly unserved by the traditional retail banks. For private investors, p2p loans created a new asset class in which they could choose for themselves in which objects/projects they invested. However, p2p loans were just another alternative investment that initially enabled the segment of self-directed private investors to allocate their capital into a different return based on a different level of security. The entrants had already shown that they were capable of improving initially inferior traditional performance attributes such as security or maximum credit amount per person. A main market entry seemed likely and was reflected in a high DP of 83% in that phase for **both market sides**. This high value of DP was also reached in the failure of incumbent phase on the **credit market side**, as the entrants were expanding their value network step-by-step from the low-end of the traditional market, in which they initially mainly addressed private individuals, to higher market segments, where they also attract small businesses and the self-employed as customers.

In 2015, incumbents also showed an average DP of 36% across all phases on the **investment market side**. Closer examination reveals, however, that the picture is more multi-faceted. As pointed out before, we generated three types of incumbent BMs (major banks, savings and cooperative banks, and direct banks) in order to address the heterogeneity of incumbent BMs. However, our DP-analysis showed that this could be reduced to two separate groups. Therefore, we formed for further reference the two groups 'branch banks' (major banks and savings and cooperative banks) and 'direct banks' that showed a similar BM and DP-pattern in their own group. DP for branch banks on the investment market side matched across all phases at an average DP of 45% and was higher than the low DP of 27% for the direct banks. Branch banks fulfilled all of the criteria for

a full DP with 100% in the foothold market entry phase. Traditional investment products for traditional bank customers were characterised by high diversity and quantity, and low transparency, which thus indicated overshooting. Furthermore, the offer of the lending marketplaces was particularly attractive for customers who did not use the standard products of the established banks. They were willing to invest in relatively risky investment objects with possible high financial and social returns and with freedom in the choice of investment objects, which was not normally offered by traditional retail banks. This market side of marketplace lending seemed unattractive for branch banks, and their main customers were not addressed. For direct banks, the DP in this phase seemed comparatively low at 25%. This was mainly because they are less affected by the overshoot customer dilemma. Main customers of branch and direct banks were so-called undershot customers who were willing to pay for better services (e.g., improvement of the products in the risk-return scheme). For them, the relevant and established performance characteristics have not changed. This was reflected in the main market entry phase without DP with 0% for the branch banks. Though direct banks showed a low DP of 25% here, due to their lack of experience with disruptive threats, they had no accumulated knowledge for responding to a PDI effectively. At the failure of the incumbent phase, no significant conclusion could be drawn about the low DP of 33% for branch and direct banks. This was because the PDI was not yet implemented in a separate business unit, and they were therefore not actively engaged in DI. The incumbent perspective of the **credit market side** provided a mixed picture with a high DP of 68% on average for all phases; a high DP of 64% relates to branch banks and a higher DP of 73% to direct banks. Branch banks were typically affected with a full DP of 100% in the foothold market entry phase. The marketplace lending sub-market appeared small and the BM unattractive for them relative to their larger business and more profitable private customers. Even if their main customers did not appreciate the marketplace lending offer, some customers, the overshoot customers, preferred the much simpler and faster LPT without personal support and service. Though the direct banks appeared to be more similar to the marketplace lending entrants in terms of customer segments, revenue generation, cost structure, settlement, and speed, they used a conventional LPT, which resulted in a high DP of 75%. In the main market entry phase, direct banks also showed a high DP of 75%. Switching

costs were low and one could easily redeem the loans with direct banks, which gave them less control over their customers. In addition to this, they had no experience in successfully dealing with disruption. None of this applied to branch banks. Their low DP of 25% was explained by the fact that they also have customers that were not yet willing to pay more for services that are significantly better (e.g., more personal customer service, more precise credit check). The branch banks and direct banks both had a high DP of 67% in the failure of incumbent phase on this market side. This was due to the fact that, on the one hand, they did not add credit offers to their product portfolio that were in any way similar to those of the new entrants. On the other hand, they did not implement PDI in a separate business unit.

In general, the credit market side showed a higher DP (73%) for the German retail banks in total, but this side cannot be seen as isolated from the investment side (DP of 36%). Even though the investment market was not as disruptive as the credit market, both sides were needed for marketplace lending business. The more loans on the credit platforms are demanded both by the overshot-customers at the lower end of the main market and by non-consumers from other markets, and the more the LPT on the credit platforms improves, the greater the security for investors through falling default rates. Therefore, more investors from other segments with more risk aversion will participate on lending marketplaces. Less risk and more supply can lead to customers from higher (mainstream) market segments being persuaded to extend credit in these marketplaces. This would also mean increasingly greater losses in the incumbents' investment business. The aggregated and therefore referred to as 'total DP' (DP^{total}) of marketplace lending platforms for retail banking in Germany was forecast at 55% in 2015. This overall assessment of the analysis thus showed at that time an average DP for the incumbent banks, including a significant degree of uncertainty. 22% of the criteria were 'unknown', i.e., it could not be assessed with certainty.

2.3.3.3. Validation of the Results of the Ex-Ante Framework by an Ex-Post Analysis in 2019

In 2020, we compared the key results of the ex-ante framework in 2015 with the ex-post analysis of the framework in 2019, as shown in Table 9, in order to assess the forecasting

potential of the chosen method. As can be seen in Table 2 no other forecasting tool had been designed for PDI by 2019 that would better meet the requirements (forecasting tool for already implemented PDIs, separate forecast for incumbents and entrants, consideration of the temporal development/phases of DI, inclusion of network effects, inclusion of specifics in two-/multi-sided markets, validated method) for this case than the modified 2015 DP framework.

A change of the DP is marked with arrow symbols in Table 9. Here, the green arrows pointing downwards indicate that the DP in the respective values has fallen from 2015 to 2019 and the red arrows pointing upwards indicate that it has risen. However, the change is only shown cumulatively in the table. The change in the respective individual criteria (see Table 3) is not directly visible in Table 9, especially if several individual values have changed for each cumulated table value. To enhance the understanding of the visual representation, the fields of the values, from which the changes originate and which arithmetically affect the other changes in the table, have been marked orange in the table. The individual criteria that caused the respective changes are pointed out in the argumentation below.

In order to be able to compare the values of 2015 and 2019, it is important to understand that smava, as one of the two main entrants in the German retail market evaluated in 2015, was no longer active in the marketplace lending business of 2019. Therefore, no values for 2019 were recorded for smava. In July 2017, smava became the first provider in Germany to offer instalment loans with negative interest rates (Spiegel Online, 2017). Furthermore, they have completely geared their BM to credit brokerage. In 2018, their brokered credit volume rose by 70% to more than 2 billion EUR (smava, 2019b). From July 2019, marketplace investment and lending were no longer possible at smava. auxmoney became their partner for marketplace loans (smava, 2019a) – from competition to cooperation due to BMI.

In 2015, smava and auxmoney showed a higher DP on the credit market side (77%) than on the investment market side (36%), whereby auxmoney, with an average DP of 64% over all phases and for both market sides, could be described as more disruptive than its competitor smava, which had an average DP of 50%. From 2015 to 2019, the overall DP

rose up to 82% on the credit market side and 55% on the investment market side. One reason for this is that smava's lower DP values are no longer included in the calculation, and only auxmoney counts for the entrants. On the other hand, several developments have taken place for auxmoney in the individual phases since 2015. auxmoney was able to record a strong growth trend both in the number of loans brokered and in the loan amounts. In addition, the number of users increased on both sides of the market, which was mutually beneficial and resulted in cross-side network effects. As the entrants were just at the beginning of their market development in 2015, a lot happened in the foothold market entry phase up to 2019, especially on the **investment market side**. The value for 'fulfilled' in this phase appears to be unchanged, with an average DP of 40%, while the value for 'unfulfilled' increased by/to 20%, and the value for 'unknown' decreased from 60% to 40%. Two main criteria have led to this change: Firstly, the product characteristics of auxmoney's offerings, measured in terms of established performance characteristics, were still very poor in 2015. At that time, for example, the scoring of borrowers was still inadequate or too immature for the decision-making process for investment products. By 2019, the scoring had improved strongly, and the criterion was therefore set from 'fulfilled' to 'not fulfilled'. On the other hand, auxmoney's products became significantly cheaper while at the same time offering higher returns, which meant that a statement classified as 'unknown' in 2015 changed to a clear 'fulfilled' in 2019. In addition, product performance in the established characteristics had improved, e.g., with higher credit volumes. This criterion therefore changed from 'unknown' to 'fulfilled' in the main market entry phase on the **credit market side**. Thus, the corresponding value rises to a full DP from 67% to 100% when 'fulfilled' and falls from 33% to 0% when 'unknown'. For auxmoney, something also changed through the failure of the incumbent phase. On the **investment market side**, changes were evident in two aspects. On the one hand, the assessment of the criterion of whether the processes of new entrants differ significantly from those of established companies changed. In 2015, this could be assumed for auxmoney, but could not be said with certainty; however, since the algorithms have improved significantly in the meantime, and the LPT has been further developed, the criterion is rated 'fulfilled' in 2019 as opposed to 'unknown' in 2015. On the other hand, the assessment of the criterion of whether the value networks of entrants and incumbents

overlap to a small extent changed. The value networks of auxmoney and the direct banks were now less different, and institutional investors were increasingly investing there (auxmoney, 2020). This also reflects the expansion from initial p2p lending to marketplace lending. Thus, the assessment of the criterion has shifted from ‘unknown’ to ‘not fulfilled’. This can be seen in summary, caused by the change of the assessment of both aspects, from the fact that the ‘unknown’ criteria for the DP has decreased from 100% in 2015 to 33% in 2019 and the criteria increased for both ‘fulfilled’ with a low DP of 33% and ‘not fulfilled’ with 33%. auxmoney now also partially addresses the value network of direct banks, which influences **both sides of the market**. This has led to this criterion (value networks overlap only to a small extent) being rated ‘not fulfilled’ in 2019 (with 33% vs. 0% in 2015) instead of ‘fulfilled’ in 2015 (with a full DP of 100% vs. a high DP of 67% in 2019) on the **credit market side**. auxmoney has grown strongly since then. It financed more than half a billion EUR in new loans in 2018 via its marketplace, thus increasing its credit volume by 74% compared to 2017 (Finanzpilot, 2018; auxmoney, 2019b). According to auxmoney, the credit volume of a medium-sized savings bank was already reached in 2018 (GeldDigital, 2019). In April 2019, auxmoney expanded its BM to include offers for corporate loans. This opened up a new customer class and significantly expanded performance trajectories. The expansion from initial p2p lending to marketplace lending is also clear on this market side. The corporate loans were granted from 10,000 to 750,000 EUR at an interest rate of 2.7% effective interest p.a. and with terms of between 6 and 60 months. solarisBank AG acted as the lending partner bank (AssCompact, 2019). They were thus on the threshold of the main market and were clearly entering the business of direct banks and branch banks (Finanz-Szene, 2018b).

As the entrants in 2015 were only or, at the most, at the beginning of market entry, something had consequently also happened with the incumbents in the foothold market entry phase. From the changes at auxmoney, it could also be expected on the part of incumbents, the **direct banks**. In this phase, this was noticeable on both market sides. On the **investment market side**, it was apparent that the main customer segment of direct banks now also appreciated the services offered by the entrants. Higher yields with, in the meantime, better risk scoring was attracting direct banks’ customers who were averse to traditional banking and had an affinity for online banking. This criterion was therefore

still 'fulfilled' in 2015 and 'not fulfilled' in 2019. The second criterion that had changed here was that the sub-market of entrants had now also become attractive for direct banks. This was characterised by a shift in this criterion from 'unknown' to 'not fulfilled'. Therefore, there was in sum a shift from 'fulfilled' and 'unknown' to 'not fulfilled'. The DP here fell from a low DP of 25% to no DP with 0% for the 'fulfilled' criteria and the 'unknown' criteria for the DP fell from 50% to 25% while the 'not fulfilled' criteria for the DP rose from 25% to 75%. On the **credit market side** the new sub-market of entrants has also become increasingly attractive for direct banks. The criterion has thus changed from 'fulfilled' (high DP of 75% in 2015 decreases to an average DP of 50% in 2019) to 'not fulfilled' (25% in 2015 increases to 50% in 2019). In a two-sided market, however, a relative parallel development on both sides of the market was to be expected. The customer gap between the largest direct bank ING Diba with 8 million (ING-DiBa, 2016) and auxmoney with 100,000 was still very large in 2015. Four years later, ING Diba was able to expand its customer base by about 700,000, but auxmoney has grown rapidly with 4.5 million customers and was even larger than the second largest direct bank in Germany, DKB, with about 4 million customers (Modern-banking, 2019).

As far as **incumbents** are concerned, our results showed that **branch banks** were most affected on the **credit and investment market side** in the foothold market entry, as they met all the criteria for a high DP (100%) there, which was unchanged in 2019. This is because p2p lending marketplaces address in 2015 and 2019 customers who were not their strategic priority or not their customers at all (low-end and new market). As a result, the p2p lending sub-market with its BM appeared unattractive to them. The main market entry and the failure of the branch banks were more conceivable on the **credit market side** (DP of 25% and 67%) than on the **investment market side** (DP of 0% and 33%). The values have not changed from 2015 to 2019 and failure is still unlikely for **both market sides**. Nevertheless, an own initiative in the sense of a spin-off that built an own lending marketplace or an acquisition or cooperation could help the incumbents to cope with this DP. For this reason, more and more banks were participating in FinTechs or trying their hand at their own greenfield solutions (Finanz-Szene, 2018a; Im Brahm, 2019; Petrović, 2019).

To handle the heterogeneity of incumbents, we aggregated on the basis of our results the three incumbent groups from the beginning into two distinct incumbent groups, namely ‘branch banks’ (major banks and savings and cooperative banks) and ‘direct banks’. On closer inspection, however, it was still possible to make a separate statement on the major banks. For **major banks**, with their main customers at companies and public authorities, no significant DP was visible at this point. Therefore, the response-strategy of ignoring seemed rational at this early stage of the disruption process. However, as the research of Christensen and Raynor (2003) shows, waiting too long could prove problematic as well since it allows the entrants to grow and prosper. A strategy of becoming a shareholder or active involvement on the investment side could be seen as a hedge against further disruption. In Deutsche Bank’s Innovation Lab and Commerzbank’s Main Incubator, for example, major banks are increasingly researching innovative banking solutions, partly in cooperation with FinTechs (Commerzbank, 2019; Deutsche Bank, 2019).

In summary, Figure 4 shows that the DP for **both market sides** and all participants fell from 63% to 61% in the foothold market entry phase because some of the criteria were now no longer considered to be ‘fulfilled’. auxmoney’s offers were increasingly improving in terms of performance characteristics, and they were more than ‘not good enough’. The sub-market of marketplace lending was slowly even becoming more interesting for incumbents, especially for direct banks. The PDI was thus slowly sneaking up on the main market of retail banking in Germany. In the main market entry phase, this was reflected in an increase of the DP from 57% in 2015 to 66% in 2019. The decisive factor here was that the products of the entrants were improved even further in order to become more attractive for the incumbents’ main customers. Entrants’ processes, e.g., the LPT, were significantly different from those of incumbents, which gave them an advantage in the failure of the incumbent phase, where DP had increased from 46% to 50%. Of particular importance is the increasing overlap between the value networks of entrants and established companies. This makes it easier for entrants to address both customers and other stakeholders of incumbents. This fact is alarming for incumbents. It is therefore very likely that they will now consciously position themselves against the entrants and react accordingly.

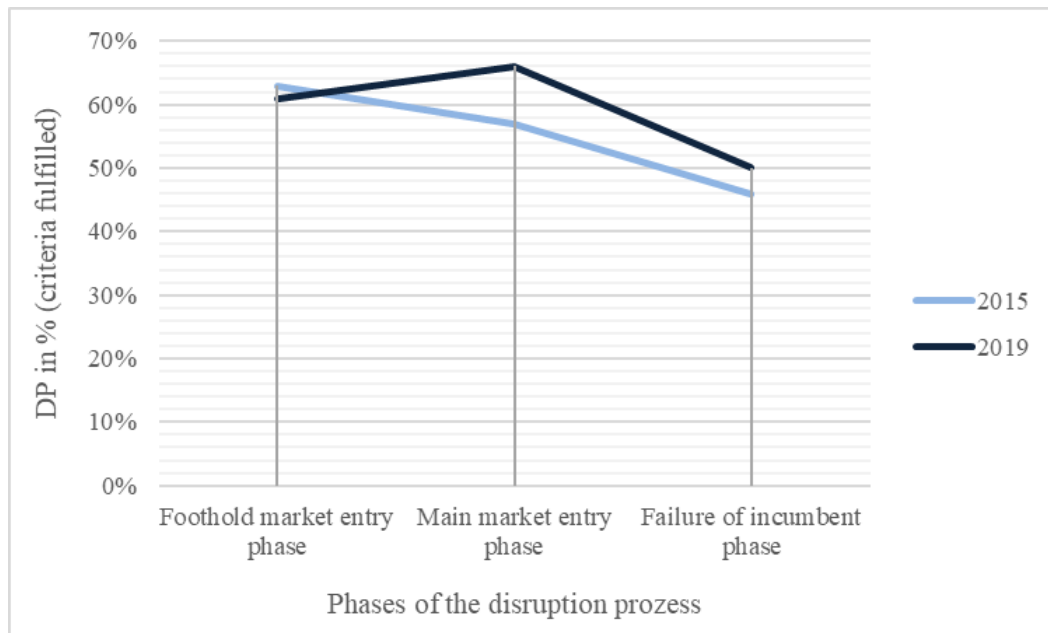


Figure 4: Development of the DP over all Disruption Phases from 2015 to 2019

In addition, the degree of uncertainty in the evaluation of the criteria changed over time. It has decreased on **both sides of the market** and for all participants from 2015 to 2019. Figure 5 shows that on the **investment market side**, 34% of the criteria could not be evaluated with certainty in 2015. It had fallen to 20% in 2019, and from 9% to 5% on the **credit market side**. This means that the future of marketplace lending for the German retail banking market was no longer so vague and blurred. Therefore, it was possible at this point to make significantly better-founded statements about future developments of the market and the players.

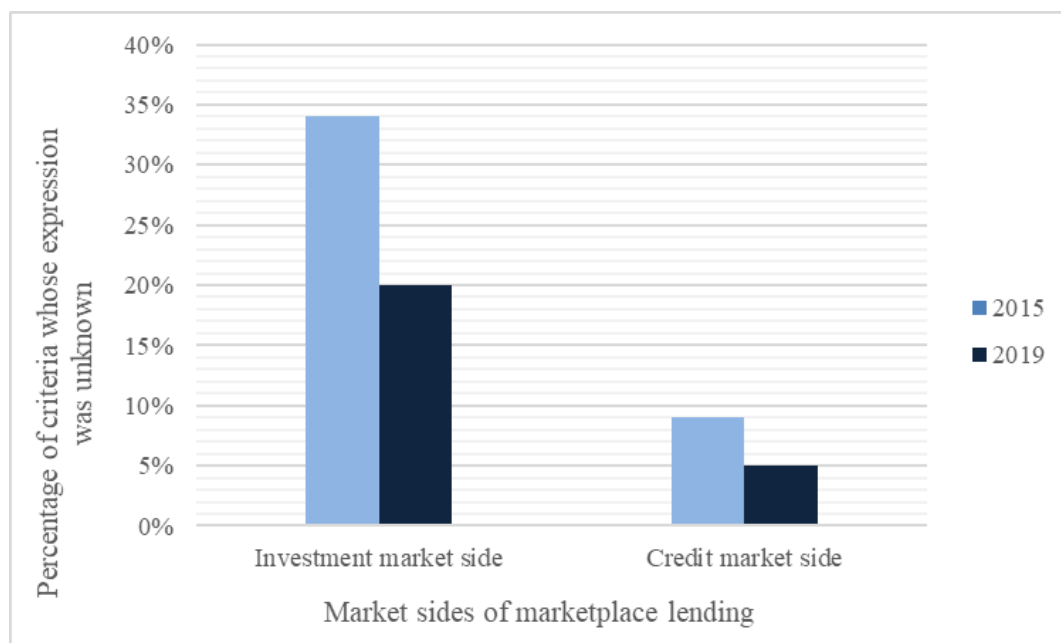


Figure 5: Development of Uncertainty Regarding to the DP from 2015 to 2019

2.4. Discussion of the Results and Implications

In our illustrative case of marketplace lending in Germany, the DP was higher on the credit market side than on the investment market side both in 2015 and in 2019. From a research perspective, it supports the assumptions made in our preliminary theoretical framework that the analysis of the DP in special circumstances such as digital two-sided markets requires a modified approach. Digital platforms in two-sided markets have two different user groups with different network effects (Parker & van Alstyne, 2005). For the analysis of the DP, this means that both sides of a digital platform can exhibit different levels of DP. As our case shows, the weakest point of the entrants' BM was the investment market side, where the DP was the lowest. On this side, the incumbents were able to get back into the game and substitute some of the 'peers' of the formerly 'p2p' marketplace lending platforms. This slowly transformed the p2p BM into a peer-to-incumbent (p2i) BM, where one of the market sides became more and more dominated by the incumbents. On the basis of what Christensen and Raynor (2003) already described as growth or investor pressure, entrants tend to corrupt their BMs, and they become less disruptive. Our modified DP framework was able to detect and predict this outcome quite smoothly

and smava, which had the lower DP of the two entrants in 2015, has already fully transformed into a p2i BM with no DP left in 2019. smava have completely geared their BM to credit brokerage with auxmoney, the other entrant, as a partner for marketplace lending. A practical implication of this is that analysts, entrepreneurs, venture capitalists, and managers in incumbent firms can use this approach to successfully recognise, develop, or adjust BMs of digital platforms in two-sided markets to find their best strategy for balancing the DP of both market sides.

The DP for both market sides decreased between 2015 and 2019 in the first phase, the foothold market entry phase, and increased in the other two phases: the main market entry phase and the failure of incumbent phase. At the same time, the uncertainty in the evaluation of certain DP properties has decreased. This shows that marketplace lending was no longer in its infancy and was moving towards the main market, as predicted in 2015. Active market developments in the current low-interest phase additionally favoured alternative and increasingly professional options for borrowing and investing.

Market entrants in our case were only at the beginning of their market development in the ex-ante survey in 2015. A lot has happened up until the ex-post validation in 2019. smava is no longer active in the marketplace lending business while auxmoney had grown strongly there. auxmoney had been able to significantly improve its offerings and the technology behind them (LPT). This applied both to borrowers, who were, for example, able to take out higher loan volumes, and to lenders, who were able to achieve a better assessment of the creditworthiness of their investment projects thanks to in-house auxmoney scoring. auxmoney had also seen a further development in the expansion of its value network. It differed less and less from that of direct banks, and institutional investors began to invest in auxmoney as well. auxmoney also expanded its BM to include offers for corporate loans. This opened up a new class of customers and considerably expanded the range of services. This also shows that initial p2p business has expanded to marketplace lending. Entrants were thus on the threshold of the main market and were clearly entering the business of direct banks and branch banks. At this point, it was unclear how the direct banks would react to this. auxmoney has grown strongly in recent years, and the gap is getting smaller and smaller. Measured by the number of customers,

auxmoney was larger than the second largest direct bank in Germany, DKB, and thus ranks second after the largest German direct bank, ING Diba. A failure of the branch banks was not expected at that point, even if some of their customers are overshot and not willing to pay even more for improved offers. At branch banks, lending volumes were much higher, the customer structure was largely different, and the value networks only overlapped to a small extent. This is even more the case for the big banks, which differ most from the entrants. They often have mainly institutional or government clients. But they are increasingly addressing the issue and investing here, either in their own incubators or in cooperation with others.

Even though these developments could not be precisely predicted by any forecasting tool, the chosen and modified DP framework could nevertheless correctly forecast the total BM imbalances on the two market sides in the different DP degrees and in terms of firm heterogeneity, which could be validated by our ex-post analysis.

2.5. Conclusions and Outlook

Christensen et al. (2018) analysed the development of research on DI and provide an extensive overview of studies and work on DI. Some of these studies also deal with the problem of ex-ante prediction. We have examined the respective ex-ante approaches based on a comprehensive literature analysis for the case of marketplace lending, but none of the pre-existing frameworks fit completely. Therefore, we developed a modified version for use in digital two-sided markets based on the ex-ante framework of Keller and Huesig (2009) and Kaltenecker et al. (2013). We were able to show that the separate analysis of the different market sides, company types, and disruption phases can lead to a better understanding of the DP of a BMI based on digital platforms. A further aggregation into homogeneous groups also proved to be helpful for pursuing analysis. In this way, indications could be found as to when, why, and by whom DI can be successfully implemented. Our approach to evaluate a forecast made in the past with the ex-post data from the present was able to produce a validation of the method for digital two-sided platforms. We share the view of Funk (2017), who suggests that assessing public forecasts helps to encourage accountability since public forecasts of technology or disruption are rarely assessed and continue to have a poor reputation. Thus, we contribute

to the ongoing discussion regarding the forecasting quality and validation of the disruption theory in general (Christensen et al., 2018; Govindarajan & Kopalle, 2006; Huesig et al., 2005). Finally, we propose that the disruption theory is also relevant for digital BM and two-sided platforms as our case study would suggest. Further studies should enlarge the empirical basis by building on more validated DP frameworks instead of reinventing the wheel over and over again. Due to our research design, we cannot generate direct management implications; however, further validations and development of this method in other areas of ex-ante DI research could lead to improved forecasting and better management decisions in the long run if the method proves to be repeatedly useful. This would unearth significant practical potential since improved forecasting capabilities could enable improved strategies and help to envision BM with higher degrees of DP on all sides of the market.

3. Paper 2: Towards a Theory on Dominant Business Model Emergence of Marketplace Lending in Germany

3.1. Introduction

Since the financial crisis in 2007, banks have had to deal with more regulation and associated rising costs. This leads to an increasing withdrawal from the banks' advisory business. Moreover, many bank customers have lost confidence in the banks and are searching for alternatives (Frerichs, 2011; Vater et al., 2012). New and companies from other industries such as Amazon, Apple or PayPal are developing cheaper, faster, and more transparent ways of handling payment transactions and are taking over existing or creating new submarkets of the banking industry. Traditional banks, such as incumbents and financial intermediaries, are being replaced more and more by new entrants in this market (Turan, 2015; Temelkov, 2018; Floegel & Beckamp, 2020; S. Zhao, 2021).

This is initially favored by the development of the internet and the so-called Web 2.0, where individuals have become increasingly accustomed to participating in the dissemination of information and direct digital interaction through their self-determined, transparent, and autonomous actions and the rising interconnection of devices, people, and companies (O'Reilly, 2005; Staehler, 2002). Increasing digitalization is further driving this development. It enables companies to innovate in processes, products, and services as well as in their business models (BMs). BM innovation is not about the nature of the innovation itself but rather how the innovation creates, delivers, and captures value for customers (Osterwalder & Pigneur, 2010; Teece, 2010; Tidd, 2019). It is particularly essential for the success of a disruptive innovation and the development of the innovating company (Huesig, 2012; Christensen et al., 2015). This interconnection of disruptive innovations and BMs enables the transformation of entire industries. As a result, innovative financial market technologies can lead to potentially disruptive changes in the banking industry, especially in the retail banking submarket (Pur et al., 2022; Gaar et al., 2021; Temelkov, 2018).

Due to ongoing digitalization, various new BMs with disruptive phenomena are frequently established on digital platforms with the character of so-called two-sided markets (Clauss et al., 2019; Trabucchi et al., 2019). They are distinguished by two distinct user groups with different network effects and often complementary offerings on both sides (Parker & van Alstyne, 2005).

Therefore, the development of the banking industry, ongoing digitalization, and cross-industry BM innovation with disruptive innovations enables new BMs in the financial industry (Borgmeier, 2009; Pur et al., 2022; Floegel & Beckamp, 2020). This was the birth of financial technology companies, or FinTechs for short, which are innovating financial services in a disruptive way based on technology-driven digital BMs (Widyanto et al., 2022; Chen et al., 2021). Among them, numerous subsets of FinTechs emerged, such as crowdsourcing, cryptocurrencies, mobile payments, etc. (Widyanto et al., 2022; Rehm, 2017). But one of the fastest growing business models globally is platform lending (formerly known as peer-to-peer (p2p) lending) (Widyanto et al., 2022; Chen et al., 2021), which uses a digital platform to bring lenders and borrowers together and manage the repayment obligation of the loan (Widyanto et al., 2022). Lending platforms in Germany compared to traditional banks have the advantage that they are generally not required to have a banking license and only need to cooperate with transaction banks for settlement (Ribeiro-Navarrete et al., 2021; Frerichs & Schuhmann, 2008). The BM of the lending platforms represents both a product innovation, because the loans, similar to a private loan, represent a new asset class for private individuals that was previously inaccessible, and a process innovation, because on the one hand investors actively and collectively decide which loan is to be financed and on the other hand a new and faster form of loan provision technology is applied (Huesig et al., 2016).

The first lending platform, Zopa, was founded in 2005 in the UK. One year later, in 2006, Prosper started in the US and many more companies followed worldwide, e. g., smava and auxmoney in 2007 in Germany. Since its beginnings, Zopa has lent out £6 billion and has over half a million customers across the UK (Zopa, 2021). Prosper has also grown very strongly, providing more than \$18 billion in loans to more than 1,100,000 people by 2021 (Prosper, 2021). According to IMARC Group (2021), the global lending platform

market grew at a CAGR of around 25 % during 2014 – 2019 and is expected to continue at this rate over the next five years. This is particularly true in Europe, where it grew by 80 % from €3.6 billion to €6.6 billion from 2018 to 2019 (Swaper, 2021). Germany is considered the second largest market in Europe with a market share of 17.7 % (Schmidt, 2020). Thus, the lending platform market is becoming increasingly important for the German banking sector (Floegel & Beckamp, 2020; Roure et al., 2022). Starting with lending between private individuals on the lending marketplaces, an increasing number of institutional investors and (small) companies to take out loans can now be found there, whereby lending platforms compete directly with (direct and regional) banks, for smaller, more risk-taking, and information-transparent private and business customers (Floegel & Beckamp, 2020).

In new or emerging technologies or markets, customer needs are usually still unclear and market players try to serve them with different BMs (Schallmo, 2014; Christensen, 1997). Over time, however, customer needs become clearer, and the different BMs of the various market players change to accommodate a better fit with the value network. Thus, the formerly different BMs converge into a unified BM, a so-called dominant design (Utterback & Abernathy, 1975; Utterback & Suárez, 1993; Schallmo, 2014; Christensen, 1997). This BM does not necessarily have to completely satisfy the needs of all customers; however, it represents the best alternative for a critical mass of mainstream customers (Ramin, 2017; Abernathy, 1978; Utterback, 1994). Studies by Doganova and Eyquem-Renault (2009), Chesbrough (2010), and (McGrath, 2010) show that there is a transitional phase in BMs before a dominant logic prevails. Only in a few places in the literature does one come across the term dominant design with reference to BMs in this context (Simmons et al., 2013). However, the importance of establishing dominant BMs is an essential area of research to consider in the future. We follow the calls of researchers such Brem et al. (2016) to analyze the different dynamics of dominant designs in other industries, especially in the service industry. In addition to that, we follow the call of Zhao et al. (2020) and explore the evolution of platform BMs in this context. Our research object, the lending marketplaces in Germany, emerged as a new and young market in 2007. Within the last almost 15 years, the industry has been able to grow immensely and establish a foothold in the banking sector. Therefore, we assume that a dominant BM is

clearly emerging or has already been established here. For our propose, we analyze the development of the BMs of Germany's three mayor lending platforms using a multiple case study with a mixed method approach. To do so, we use the case study approach from Yin (2009) and Eisenhardt and Graebner (2007), which is particularly appropriate for answering "how" and "why" questions to analyzing current phenomena (Benbasat et al., 1987; Yin, 2014), and apply the nine BM components (BMCs) from Osterwalder and Pigneur (2010) as the theoretical framework for our qualitative BM analysis. This qualitative analysis is complemented with a quantitative test of their total asset annual growth rates (Entrop et al., 2015).

The following research questions are addressed by using this approach:

1. How can the similarities and differences between the BMs of the main German lending platforms be described?
2. How and why could a dominant BM design among the lending platforms in Germany have emerged?

The paper is organized as follows: In the next section, we briefly discuss the theoretical background of BMs and develop our preliminary propositions. Following this, we describe our research methodology and the selected lending platforms. Next, we conduct the cross-case analysis by comparing the different BMs and BMCs of the companies. On this basis, we formulate a modified testable proposition. This proposition is then statistically tested, and the findings are integrated in our theory development. Due to the rapid BM developments of the lending platforms studied, we distinguish in the qualitative analysis between the period since the foundations until 2016 and from 2016 onwards, whereby 2016 is set as the point in time for the detailed study of the individual BMCs, as significant changes have taken place from then onwards, which will also be discussed in detail. The quantitative analysis covers the entire period and references, among other things, significant changes in the respective BMCs. Figure 6 illustrates this approach.

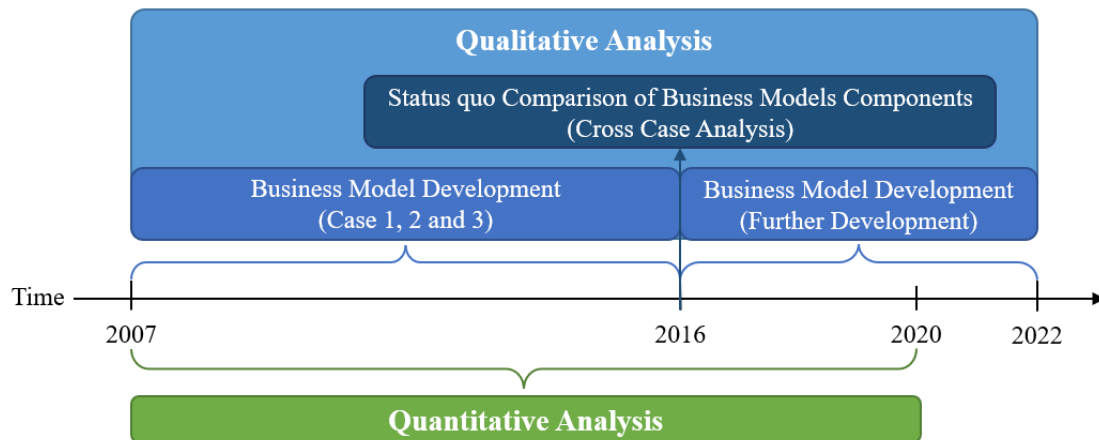


Figure 6: Time Sequences of the Qualitative and Quantitative Analysis

Finally, we theorize how and why a dominant BM design among the lending platforms in Germany has or has not emerged. In this context, we point out valuable insights for BM evolution and its modifications in the case of lending marketplaces in Germany. The final section summarizes findings, limitations, and suggests further research options.

3.2. Theoretical Framework

3.2.1. Concept of Business Models and the Business Model Canvas

The concept of BMs has gained increasing attention in both academia and practice since the mid-1990s, especially with the rise of the internet and associated electronic business (Trabucchi et al., 2019; Amit & Zott, 2001). To date, however, there is no common definition for the term BM, and many different and initial definitions still prevail (e. g., Stewart and Zhao (2000), Applegate and Collura (2001), Afuah and Tucci (2001), Osterwalder and Pigneur (2010), Weill et al. (2011), Zott et al. (2011), Bieger et al. (2011), Weiner et al. (2010). According to Berger and Hess (2015), most definitions agree that a BM should provide information on how a company creates value and generates revenue from it. Accordingly, it serves to describe a company's value creation process and competitive advantages (Trabucchi et al., 2019).

When changing an existing BM or designing a new one for the first time, the terms BM innovation and BM design are applied (Foss & Saebi, 2017; Massa et al., 2017; Trabucchi

et al., 2019; Ghezzi et al., 2013; Ghezzi et al., 2015; Trimi & Berbegal-Mirabent, 2012). In this context, according to Trabucchi et al. (2019), the BM Canvas by Osterwalder and Pigneur (2010) is one of the most important developments in the field of BM design. The advantage of the BM Canvas is that it considers different dimensions and perspectives of BMs and has found a lot of application both in practice and in academia, especially in analyses of companies in case studies (Chesbrough, 2010; Adrodegari et al., 2017; Bertels et al., 2015; Daly, 2017; Toro-Jarrín et al., 2016). Therefore, the concept by Osterwalder (2004) and Osterwalder and Pigneur (2010) provides the basis for our study and discussion in this paper.

Osterwalder and Pigneur (2010, p. 14) define a BM as “... the rationale of how an organization creates, delivers, and captures value”. For analyzing a BM in a companywide context and system, a framework or blueprint is necessary (Osterwalder, 2004; Weiner et al., 2010). With the BM Canvas, they provide a conceptual tool to describe companies’ strategic core elements as nine BMCs and their relationship (Osterwalder, 2004; Osterwalder & Pigneur, 2010). Within this framework, shown in Figure 7, the BMCs Key Partners, Key Activities, and Key Resources have a direct impact on the Cost Structure of the company whereas the BMCs Customer Relationship, Customer Segments, and Channels influence the Revenue Streams. The BMC Value Proposition shows what the company offers to the customers and brings both sides together.

For this reason, the BM Canvas is well suited to compare BMs and provides the answer to the first research question.

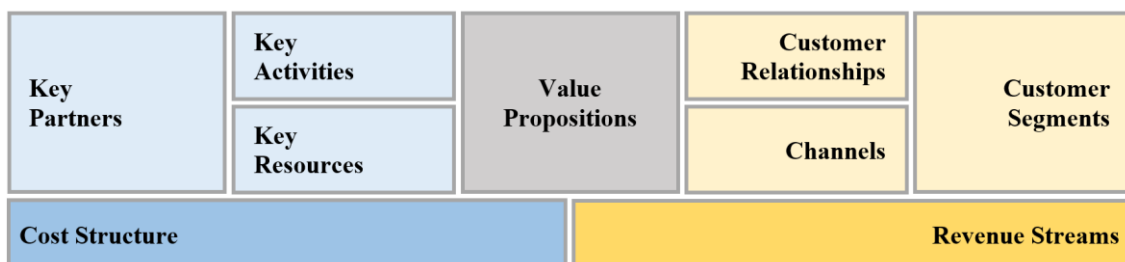


Figure 7: BM Canvas (Osterwalder & Pigneur, 2010)

3.2.2. Dominant Design and Standard Business Models

In emerging technologies and in emerging markets, no ideal BM is yet apparent (Teece, 2010; Bohnsack et al., 2014). Several different BMs usually exist, each trying to serve the still largely unknown customer needs in an ideal way (Schallmo, 2014; Christensen, 1997). Over time, customer needs become clearer, and BMs are further aligned and fine-tuned towards a better value network fit (Morris et al., 2005; Sosna et al., 2010; Teece, 2010; Demil & Lecocq, 2010; Chesbrough, 2010) until a generic BM converged from previous approaches is found that best serves customer needs and is considered by the market to be the standard for the entire industry (Ramin, 2017; Morris et al., 2005). This standard is also referred to as the dominant design following Abernathy and Utterback (1978) and Utterback (1994).

Following Brem et al. (2016), the definition of a dominant design has been increasingly specified (Srinivasan et al. 2006; Narayanan & Chen 2012; Abernathy & Utterback 1978; Utterback 1994; Anderson & Tushman 1990; Christensen et al. 1998; Murmann & Frenken 2006). Finally, we follow their definition in this study, that a dominant design is a de facto standard where the design of a product is accepted as the leading design in the industry or product category (Brem et al. 2016; Soh 2010). In the context of BMs, this means that an ideal-typical BM accepted in the industry is called a standard BM or dominant BM.

In this context, a dominant design marks a turning point for an industry (Ramin, 2017; Brem et al., 2016). At this point, industry dynamics change (Anderson & Tushman, 1990; Rosenkopf & Tushman, 1994; Baum et al., 1995), and competition no longer takes place through product innovations but rather through process innovations (Dodgson et al., 2013; Ramin, 2017). Thus, a dominant design affects technology life cycles and corporate strategies (Srinivasan et al., 2006; Brem et al., 2016). At the beginning of an emerging market, major (more radical) product innovations are predominant, aligning one's BM ever closer to emerging customer needs. From the point of the dominant design, these decrease sharply and (incremental) process innovations improve the offer (Utterback & Abernathy, 1975; Akiike, 2013; Brem et al., 2016). This is reflected in the increasing efficiency of product development and the decreasing number of competitors (Utterback

& Abernathy, 1975; Suárez & Utterback, 1995). In addition, according to Brem et al. (2016), it is, however, also evident that a negative relationship between dominant design and the degree of innovation prevails, i. e., the innovation performance in the industry decreases because a dominant design is established. Therefore, almost all successful companies modify their BM towards these dominant BMs (Schallmo, 2014). The successful companies that do not follow the dominant design usually serve niches (Ramin, 2017; Schallmo, 2014; Christensen, 1997). Moreover, for the successful setting of a dominant design, a close cooperation with partners in different areas of value creation is useful (Brem et al., 2016).

There is no unique model in the literature that describes under what concrete circumstances a BM has reached a dominant design and what components of the BM must be affected. In the context of BM innovation, Foss and Saebi (2017) discuss different scholars who suggest from one extreme understanding that one component of the BM affected is already sufficient for a BM innovation to the other extreme where all components of the BM must be changed. They also do not identify a systematic analysis of dimensionalization in BM innovations. Based on our definition of the BM according to Osterwalder and Pigneur (2010), and following Schallmo (2014), we focus on the customer-centric perspective for BM innovation and dominant design of the BM. Thus, we propose that a dominant BM is prevalent in an industry if the BMs of the main players coincide at least in the BMCs Value Proposition, Customer Segments, Customer Relationship, Channels, Revenue Streams, and Cost Structure. It is obvious that the respective BMCs cannot be completely identical and differ in detail. In addition, BMCs Customer Relationship and Channels are ways to the customer, which can also have an experimental character and can be changed quickly. The other BMCs Key Partners, Key Activities, and Key Resources take place within the company, are not visible to the customer, and are therefore of secondary relevance to us. The BMC Cost Structure, even though it also has an internal character, is relevant to describe and understand the money flows. Therefore, we include it in our approach of a dominant BM.

3.2.3. Business Models in Digital Two-Sided Markets

Positive externalities and associated network effects are a key feature of Internet-based BMs (S. Zhao, 2021). Digital platforms in two-sided markets have a special role here. They play an intermediary role by connecting (at least) two different and mutually attracting user groups (Parker & van Alstyne, 2005; Rochet & Tirole, 2003; Hagiu & Wright, 2015; Cennamo & Santaló, 2015), and have strong network externalities on both sides (Parker & van Alstyne, 2005; Hagiu, 2007; Katz & Shapiro, 1985). The markets' search costs can be reduced; alternative or complementary products and services may occur, resulting in indirect network effects; and the number of transaction partners increases, generating direct network effects (Barasinska et al., 2011; Parker & van Alstyne, 2005; Rochet & Tirole, 2003). The interplay between direct and indirect network effects significantly influences the long-term success of digital platforms (McIntyre & Srinivasan, 2017).

When it comes to getting both sides on board, we assume that two-sided platforms can have a different BM on each side. Designing the two BMs usually proves difficult because neither side can exist without the other. This is referred to as the “chicken-egg-problem” of the platform owner. One side of a digital platform is often treated as a profit center and the other as a loss leader, or as financially neutral (Song et al., 2018). However, a healthy platform BM can only be effective if both sides receive the same attention (Pur et al., 2022). In this context, the platform owner plays a decisive role (Zhao et al., 2020). He can design the BM of the platform according to its rules and his economic interests, define the platform standards and interfaces, and control the flow of information, whereby he can significantly influence the development himself. In this context, it is also crucial to mitigate the information asymmetries prevailing on the platform in order to provide lenders with better information about loan applications and loan takers (Ribeiro-Navarrete et al., 2021). Thus, while he is very powerful, he is also highly dependent on his value network. Yet the desired network effects are generated only as long as the platform remains attractive to his customers. On a platform with positive externalities on both sides, decreasing network effects and number of customers on the one side inevitably causes a decrease in network effects and number of customers on the other side

(Barasinska et al., 2011; Parker & van Alstyne, 2005; Rochet & Tirole, 2003; McIntyre & Srinivasan, 2017). A downward trend is hard to stop and results in more and more customers migrating to other platforms.

3.3. Qualitative Analysis: The Case of Lending Platform Industry in Germany – an Emerging Dominant Business Model?

3.3.1. Methodology and Data

For our analysis, we used the case study approach of Yin (2009) and designed a descriptive and explicative case study on a firm level with a mixed methods approach. Typically, case studies take place within a real-life context, combine numerous data collection methods and sources, and tend to focus on an in-depth understanding of the dynamics in a single setting (Yin, 2009; Eisenhardt & Graebner, 2007). The goal of this approach is to derive empirically supported hypotheses from a case study analysis, which can and should be examined in a larger number of cases or by a large-scale study (Yin, 2009). As a preliminary theoretical framework for the empirical analysis of the BM, the BM Canvas from Osterwalder and Pigneur (2010) was chosen. In addition to that, data triangulation emphasizes the reliability and validity of qualitative research in general and is paramount for case studies (Yin, 2009; Huberman & Miles, 1994). The different expertise of the authors allows for a broader and deeper view of the research questions and thus a mixed method approach with data triangulation (McKim, 2017). For this reason, in addition to qualitative evaluation techniques, quantitative analyses were used to support our findings. We consider the data situation to be very good for our analysis since the BMs of online platforms are generally transparent and easily observable by secondary sources. Therefore, we studied, among others, news archives, reports, annual reports, published interviews and websites.

To address the research questions adequately, we analyzed the three lending platforms in Germany from their foundation to the year 2016: smava, auxmoney and Lendico. smava and auxmoney have been the main actors in the branch in Germany since 2007. While smava was market leader for a long time, auxmoney took the lead in 2015 (Huesig et al., 2016). After initializing the branch, further lending marketplaces emerged in Germany.

Therefore, we examined the German lending platforms that are accessible to private persons on both the investment and lending side and dominate the German lending industry in mediated loan volumes (Tielmann, 2016). Thus auxmoney, smava, and Lendico are the object of this case study.

Since 2016, there have still been significant BM innovations, which are discussed separately after the cross-case analysis and also addressed in the quantitative analysis.

3.3.2. Case 1: auxmoney

In 2007, auxmoney was founded by Raffael Johnen in Düsseldorf (auxmoney, 2016g). The company started as a free marketplace where private investors and private borrowers were able to meet each other in an unsupervised environment. There was, however, a lot of criticism due to the absence of transparency and security and because they already charged fees in the run-up to a loan arrangement (Stiftung Warentest, 2007). Every investor could meet every borrower, with information (personal and creditworthiness) only offered and selected by the borrower itself. An investment in credit projects without any creditworthiness is very risky and hardly calculable. As with the other lending marketplaces in Germany, a transaction bank is needed. It takes care of the payout in the background and rejects applicants with a negative Schufa score. However, if the applicant wants to show his score to potential investors, he must have it calculated through auxmoney. The procedure is called “certificate creation” and auxmoney makes the borrower pay for it (Stiftung Warentest, 2009). The credit applicant could also buy additional certificates with which, e. g., he can have his identity verified, or he allows enquiries to be made to the employer (Stiftung Warentest, 2013). In addition, the borrower had the option of taking out default insurance. But nevertheless, the default risk was borne entirely by the lender (Stiftung Warentest, 2008). Incidentally, the interest rate was set by the credit seeker himself (Stiftung Warentest, 2009). In response, auxmoney mainly changed its BM in 2013 through process optimization (Skrabania, 2014; Alexandru, 2012): the website underwent a new design, a new logo was introduced, and financing ratio and finance velocity were significantly increased (Schmidt, 2014). In 2015, a year after family offices also invested on the platform, auxmoney began to expand its investor base to include large institutional investors, such as insurer Aegon (auxmoney,

2015b). Additionally, in the course of 2015 it modified its BM with more security for investors. Thus, auxmoney achieved a credit volume of €357 million in October 2015 as the new market leader in Germany (auxmoney, 2015a, 2015c).

3.3.3. Case 2: smava

smava was founded in 2007 by Team Europe (Alexander Artopé, Eckart Vierkant and Sebastian Rieschel) with its headquarter in Berlin (smava, 2015). It started as a private-to-private platform that carried out i.a. Schufa inquiries and Post-Ident, a method of secure personal identification at German post offices, of the credit seekers from the very beginning and offered private investors hedges in case borrowers stopped repayments. In this case, the affected lender is financially supported by other lenders (pooling) and a collection agency bears part of the loss (Stiftung Warentest, 2008). Fees were only charged when the loan was taken out and only of the borrower (Stiftung Warentest, 2007). The interest rate and term are determined by the borrowers, who are not only private individuals, but also freelancers and tradespeople (Stiftung Warentest, 2008). smava changed and expanded its BM from a private-to-private credit transfer to a credit comparison portal in 2011 (Huesing, 2012; Hetzer, 2015; Stiftung Warentest, 2013). By modifying the BM in its architecture, banks were added as additional lenders to the existing customer segments (Skrabania, 2014; Alexandru, 2012; Stiftung Warentest, 2013). Therefore, it was possible to offer longer terms and higher credit amounts (smava, 2013) to the borrowers and to gain new customer segments, e. g., customers with loyalty to and trust in traditional banks. This enabled additional sources of income for smava, namely, fees from partner banks and from new customer segments. The development of the BM is reflected in the slogans over the years: from “credits from person to person” (German: “Kredite von Mensch zu Mensch”), to “direct credit” (German: “Direkt Kredit”), or “The first credit marketplace” (German: “Der erste Kreditmarktplatz”) (Huesing, 2012), and in 2016 “Your credit is here” (German: “Ihr Kredit ist da”), (smava, 2016i). The former exclusively private-to-private lending was meanwhile only one product, called “smavaprivat”, of the whole product portfolio in addition to the offer of traditional bank loans over the platform (Hetzer, 2015; Huesing, 2012; Stiftung

Warentest, 2013). According to its own statement in 2016 smava was Germany's largest credit comparison portal (smava, 2016j).

3.3.4. Case 3: Lendico

Lendico was founded 2013 in Berlin by the company builder Rocket Internet with managing directors Dr. Christoph Samwer, Dr. Clemens Paschke, and Dr. Dominik Steinkühler (Lendico, 2016h; Huesing, 2013). At the beginning, Lendico followed the same approach as the first two companies did when they began. The company started lending from private-to-private. As a new growing competitor in the classical banking industry, they target typical bank customers rather than customers who have a hard time getting bank loans approved due to their (economic, personal, etc.) situation (Lendico, 2013; Hess, 2014). However, it expanded into different countries at the same time, whereas auxmoney and smava were still national players in Germany. Six months after its founding, the company was active in five countries and on two continents (Lendico, 2014). After 18 months, the company had generated €1 billion in seven countries (Barsch, 2015). At the beginning of 2014, Lendico reacted to poor turnover volumes in South Africa, Spain, and Poland. The country offices were closed, and 20 employees were laid off. Furthermore, Lendico modified its BM in 2014. Initially private investors in three countries were prohibited from investing in credit projects. Since then, only selected, institutional investors may invest in these countries. In the other countries, the BM remained unchanged. In March 2015, the BM was then extended by corporate credits (Wirringhaus, 2015a, 2015b). Therefore, Lendico was the first company in Germany to offer private and corporate loans (Lendico, 2015; Wirringhaus, 2015b).

3.3.5. Cross Case Analysis

To conduct a cross case analysis of smava, auxmoney, and Lendico, we followed the BM Canvas approach of Osterwalder and Pigneur (2010) (Figure 7). First, we analyze every BMC for every lending platform separately. We then juxtapose the findings of the three companies in a detailed table (Table 10) and explain the comparison in general below, before drawing a conclusion on the hypothesis that there is a dominant BM in lending marketplaces in Germany based on the qualitative results.

Even though the BMCs Key Partner, Key Activities, and Key Resources are not part of the dominant BM scope, they have a direct impact on the BMC Cost Structure and are analyzed for a deeper understanding.

			Auxmoney	smava	Lendico	Indication of a dominant BM
Customer Segments	Investors	Private Investors	✓	✓	✓	✗
		Institutional Investors	✓	✗	✗*	
		Partner Banks they are offering/mediating credits to	✗	✓	✗	
	Borrowers	Private Borrowers	✓	✓	✓	
		Companies/Business Borrowers	✗	✓	✓	
Customer Relationships	Personal advice	Telephone/Customer Service	✓	✓	✓	✓
	Automated consulting	Investment tools	✓	✓	✗	
		Yield calculator	✗	✗	✓	
		Credit assessment	✓	✓	✓	
		Campaign loans	✗	✓	✗	
	Self-service	Website	✓	✓	✓	
		FAQs/Help	✓	✓	✓	
Blog		✗	✓	✓		
Channels	Facebook		✓	✓	✓	✓
	Twitter		✓	✓	✓	
	TV advertising		✓	✓	✗	
	Digital platform		✓	✓	✓	
	YouTube		✓	✗	✗	
	Own company blog		✗	✓	✓	
Revenue Stream	Investor	Investment amount	1 %	1.35 %	✗	✗
		Interest rate and redemption payment	✗	✗	1%	
	Borrower	Loan amount	2.95 %	✗	0.25-4.5 %	
		Intermediaries fee	✗	35 months at 2.5% 60/84 months at 3%	✗	

Table 10: Comparison of BMCs of Germanys Lending Platforms

		Auxmoney	smava	Lendico	Indication of a dominant BM	
Value Propositions	Credit range	Private	1,000-25,000€	1,000-50,000€	1,000-30,000€	x
		Companies	x	x	10,000-250,000€	
		Banks	x	1.000-120.000€	x	
	Runtime		12-60 months	36, 60, 84 months	6-60 months	
	Investment	Private	< 25€	< 250€	< 25€	
		Companies	x	x	< 100€	
	Return		< 7.7%	?	< 10.99%	
	Investment tools	Individual investment	✓	✓	✓	
		Additional services	Portfolio-Builder	smava Professional	Standard account	
			Re-Invest	smava proxy bidding	Professional account	
				smava yield calculator		
				Investor pooling		
				Guaranty for best interest rate		
			Promotional credits			
Key Partner	Investors	Index Ventures	Earlybird	Rocket Internet	✓	
		Square Ventures	Neuhaus Partners	Holtzbrinck Ventures		
		Foundation Capital	Banca Sella	Access Industries		
			Econa AG			
			Phenomen Ventures			
	Partner bank	SWK Bank	Fidor Bank AG	Wire Card AG		
		Biw Bank				
	FinTech for algorithm		Arvato Infoscore GmbH	Infoscore Consumer GmbH		FinTech Systems
	Auditor for credit standing	Schufa	✓	✓		✓
		Creditreform	✓	x		✓

Table 10: Comparison of BMCs of Germanys Lending Platforms (continued)

			Auxmoney	smava	Lendico	Indication of a dominant BM
Key Activities	Platform/network	Operation and development of the digital platform	✓	✓	✓	✓
		Selection of the loan applications	✓	✓	✓	
		Development of algorithm of credit assessment	✓	✓	✓	
		Marketing	✓	✓	✓	
Key Resources	Algorithm of credit assessment		✓	✓	✓	✓
	Digital platform		✓	✓	✓	
	Partnerships		✓	✓	✓	
	Employees		120	80	80	
Cost Structure	Digital platform		✓	✓	✓	✓
	Employees		120	80	80	
	Credit standing auditor		✓	✓	✓	
	Marketing		✓	✓	✓	

Note: *not in Germany but in South Africa, Spain, and Poland

Table 10: Comparison of BMCs of Germanys Lending Platforms (continued)

Customer Segments: What all of the three companies have in common is that they address credit mediation between private persons. However, auxmoney mediates private loans from private (Bertram, 2014; auxmoney, 2016f) and, more recently, institutional investors (auxmoney, 2015b). smava offers their private and business borrowers a credit from private investors and form partner banks (smava, 2016i; Hetzer, 2015). Lendico meditates in Germany credits from private investors to private borrowers and companies (Lendico, 2016g).

Thus, the BMC Customer Segment does not indicate a dominant BM.

Customer Relationships: All three of the companies use the same main possibilities for building customer relationships, e. g., call centers (auxmoney, 2016g; smava, 2016i; Lendico, 2016g) and “FAQs” or “Help” sections on their websites (auxmoney, 2016b; Lendico, 2016e; smava, 2016d). However, where smava and auxmoney offer tools for an automatic investment in different personalized risk classes, Lendico only offers an opportunity to invest in general (auxmoney, 2016c; smava, 2016c; Lendico, 2016b).

Thus, the BMC Customer Relationships indicates a dominant BM.

Channels: For a target customer approach, all of them use viral channels like Facebook & Co besides the website itself (auxmoney, 2016g; smava, 2016i; Lendico, 2016g). smava and auxmoney additionally apply TV-Spots to address a wider range of customers (Jaeger, 2016). For closer contact, smava and Lendico are using Blogs while auxmoney prefers to make use of a YouTube channel (smava, 2016e; Lendico, 2016d).

Thus, the BMC Channels indicates a dominant BM.

Revenue Streams: The revenue streams are different at the three companies. On the investment side, auxmoney and smava charge a one-off service fee from the investors, whereas Lendico charges a recurring one. On the credit side, the three companies use different names for the same kind of service fees but charge different amounts. At auxmoney, the fee is fixed, at smava, the fee depends on the runtime, and at Lendico, it is individualized and depends on various factors (auxmoney, 2016a; smava, 2016b, 2016f; Lendico, 2016e, 2016b).

Thus, the BMC Revenue Streams does not indicate a dominant BM.

Value Propositions: Credit range and runtimes differ at the three companies and in different customer segments. From the investors point of view, auxmoney and Lendico offer a lower minimum investment for private loans than smava (auxmoney, 2016e; Lendico, 2016g; smava, 2016a). Even the returns show further differences between the companies (auxmoney, 2016d; Lendico, 2016f). Moreover, the company's value propositions differ in other aspects, e. g., protection in the case of a credit default in form of investor pools at smava (smava, 2016d) and a supporting tool for the investment procedure at auxmoney and smava (auxmoney, 2016c; smava, 2016c).

Thus, the BMC Value Propositions does not indicate a dominant BM.

Key Partners: All three companies get investors in different financing rounds on board (auxmoney, 2016g; Jaeger, 2016; smava, 2015; Huesing, 2011; Lendico, 2016h). As none of them has a bank license, they need partner banks that are legitimized to offer credit to their customers (Bertram, 2014; smava, 2016g; Lendico, 2016c). In addition to this, all of them need a partner for the development of the algorithm for checking the

creditworthiness (Garno Media, 2015; Lendico, 2016d) and for credit validation purposes (smava, 2016h; auxmoney, 2016h; Lendico, 2016a).

Thus, the BMC Key Partners supports a dominant BM for the BMC Cost Structure.

Key Activities: The main activity of the companies operating in two-sided markets with network effects is the operation and further development of the digital platform. The three companies hardly differ in this respect. They are continuously working to improve the credit application selection and credit scoring algorithm, which will result in better quality credit applications (Lendico, 2016d; Garno Media, 2015; auxmoney, 2016h). Extensive marketing is also undertaken to communicate the benefits of the platforms and for gaining new customers (Mauquoi, 2015).

Thus, the BMC Key Activities supports a dominant BM for the BMC Cost Structure.

Key Resources: The key resources are mostly the same for all three companies. The main technical resources are the platform and the algorithm of credit assessment. Employees are considered to be human resources and financial resources arise mainly from strategic partnerships, e. g., investors and from customers.

Thus, the BMC Key Resources supports a dominant BM for the BMC Cost Structure.

Cost Structure: All three of the companies have the same cost drivers. These are mainly for the operation and further development of the digital platform and the credit rating algorithm, for the payment of the employees, and for different types of marketing (K. Schneider, 2015; Schmidt, 2014; Mauquoi, 2015; Lendico, 2016h).

Thus, the BMC Cost Structure indicates a dominant BM.

3.3.6. Discussion and Results of the Cross Case Analysis: Dominant BM at Lending Marketplaces in Germany in 2016?

According to Schallmo (2014), a dominant BM within a sector is given when the BMs of an industry are based on an ideal-typical BM established over time. However, a dominant BM is not evident when looking at these three companies (Figure 8). Six of the examined nine BMCs can be considered as convergent (marked with ticks): Key Partners, Key Activities, Key Resources, Cost Structure, Customer Relationships, and Channels. The

three BMCs Customer Segments, Revenue Streams, and Value Proposition (marked with crosses) differ from each other and must therefore be regarded as divergent. There is only a dominant BM if the BMCs examined largely coincide at least in the BMCs Value Proposition, Customer Segments, Customer Relationship, Channels, Revenue Streams, and Cost Structure, which is not the case. These differences mainly result from the differences between the BMC Customer Segments and depend on each other. As the BM of auxmoney focuses on private-to-private lending, with increasingly also institutional investors, this BM does not play a central role at smava anymore. The lending platform with its partner banks for credit mediation serves instead as a credit comparison portal rather than a classical lending platform. Lendico has the additional target group on the credit side and grants corporate loans in addition to private-to-private loans. Each company developed a different focus. The extended Customer Segments offer additional Revenue Streams and lead to different Value Propositions for the particular Customer Segment. Therefore, we derive the following proposition on the basis of our case study analysis: The German lending platform industry does not show a strong tendency towards a dominant BM in two-sided markets.

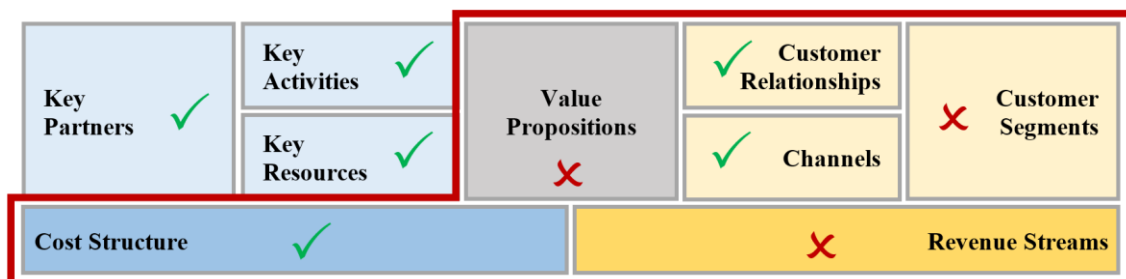


Figure 8: Result of the Cross-Case Analysis of the Lending Platforms across all BMCs in the BM Canvas in 2016

3.3.7. Further Development of Lending Marketplaces since 2016

The development of divergence and diversification of the three platforms could further be observed since 2016. The BMCs of the three companies have evolved, especially with regard to the critical BMCs Customer Segments, Value Propositions and respective Revenue Streams.

Since 2019, auxmoney has been offering consumer loans for private individuals and the self-employed with loan amounts of up to €50,000 as well as corporate loans with loan amounts of up to €750,000, thus appealing primarily to small and medium-sized enterprises (auxmoney, 2019). In 2020, auxmoney established auxmoney Investments to manage retail and institutional investor financing and asset-backed financing structures (auxmoney Investments, 2022). In doing so, they targeted global institutional investors and show clear internationalization efforts (Klatt, 2021a). As of November 2021, only automatic investments on the marketplace were possible at auxmoney. The function of manual selection of individual loan projects was then no longer offered (auxmoney, 2021). In 2022, auxmoney specialized exclusively in institutional investors and no longer offered private investments (auxmoney, 2022a). Whereas the business loans introduced in 2019 are no longer available in that form, but only personal loans, which are also granted e. g. to small and medium-sized enterprises and the self-employed (auxmoney, 2023).

smava has modified its BM into a pure loan comparison portal. As of July 2019, marketplace investing, and lending are no longer possible. However, they named auxmoney as their partner for marketplace loans (smava, 2019). In 2023, over 70 financial products from over 20 partners and banks are compared and mediated there, although inexplicably auxmoney is still listed as a partner for loans from private individuals (smava, 2023).

Since the sale of Rocket Internet, Lendico has shifted its focus exclusively to corporate loans in 2017 (Eich, 2017). In 2018, Lendico was acquired by ING Germany, where it was fully integrated into the Business Banking division tasked with digital lending to small-sized enterprises and the self-employed in 2022 (Schürmann, 2022).

3.4. Quantitative Analysis: A Dominant Design Convergence of Business Models in the German Lending Platform Industry?

As already mentioned, a dominant BM may arise over time in established industries. When this dominant BM works best for the value network, the context in which a company identifies and serves the customer needs best in this market (Christensen, 1997),

we assume that only companies that modify their BM towards this ideal-typical BM can be successful. Excluding BMs that serve niches, we expect BMs that do not follow a dominant BM (Schallmo, 2014) are dominated by BMs that follow a dominant BM.

3.4.1. Descriptive Analysis

As is common in financial studies, we include total assets (see, e. g., Entrop et al. (2015)) to make companies such as institutions comparable. Using an analysis of total asset annual growth rates of the German lending platforms discussed before, we aim to quantitatively assess whether the proposition formulated previously must be rejected or not. Therefore, we use data from the Bundesanzeiger (Federal Gazette), as valid publicly accessible source for viewing companies' financial statements. Hence, we analyze the success of BMs based on annual growth rates (GR) of total assets (TA) to identify whether GR of a specific BM is dominant. GR for company i at time t are calculated as the relative difference between TA for company i at time t and TA for company i at time $t-1$, as Equation (1) illustrates.

$$GR_{i,t} = \frac{TA_{i,t} - TA_{i,t-1}}{TA_{i,t-1}} \quad (1)$$

In the case where only an ideal-typical BM is successful, GR of a dominant BM should significantly exceed those of other BMs or lead to decreases in GR of dominated BMs. In this context, Figure 9 shows the development of smava, auxmoney, and Lendico GR between 2007 and 2020.¹ The different data sets of the analyzed products are due to varying starting points and data availability. For smava, e. g., TA are available between 2006 and 2017. After 2017, smava is not included in the Federal Gazette and diverse attempts to obtain TA data was not successful. However, Figure 9 GR results are unequivocal. For auxmoney TA is available between 2007 and 2020 and for Lendico between 2013 and 2020³. It is interesting to observe that GR of smava and auxmoney closely correspond over time. For these two companies, we cannot observe a dominant BM. This is also the case for Lendico. In 2014 and 2015 GR of Lendico nearly one-on-one corresponds to smava. In line with auxmoney, the variation of GR is also reduced for

³ TA data are available until 2020 in the Federal Gazette.

Lendico from 2015. The outlier in 2020 can be explained by the acquisition by ING Germany, as described in the Federal Gazette. In an appendix, we illustrate the robustness of this finding based on the funding volume.

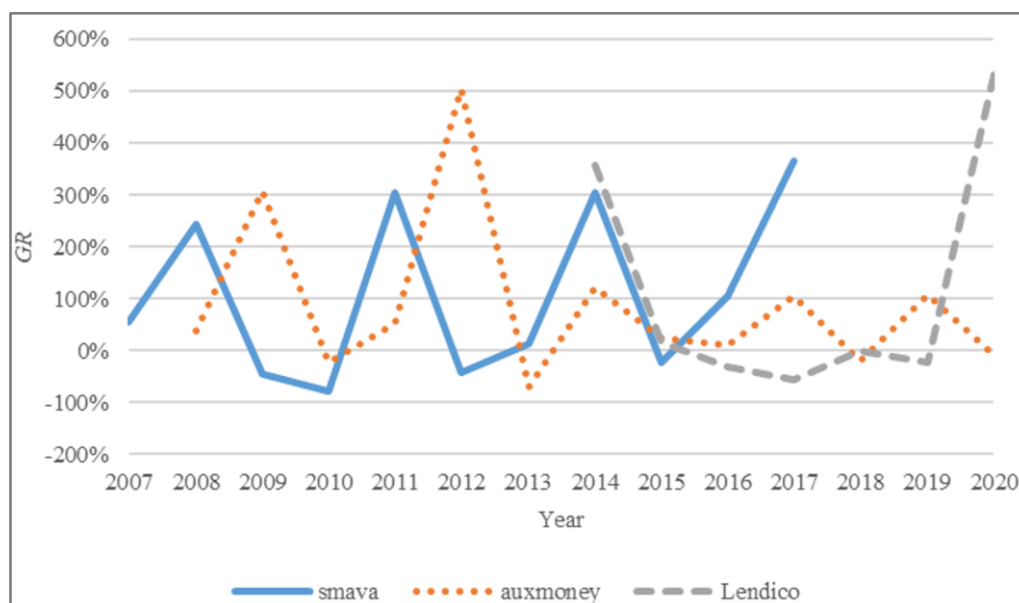


Figure 9: Development of GR (%) of smava, auxmoney, and Lendico

Table 11 illustrates summary statistics of smava, auxmoney, and Lendico GR. For all products, GR mean values range between 88.395 % and 113.486 % are largely comparable. This is also valid for minimum, maximum and standard deviations. The median value of Lendico shows a decrease relative to smava and auxmoney. However, for all products values are positive. Altogether, the descriptive results suggest that no dominant BM can be observed for the German lending platform market.

	GR (%)		
	smava	auxmoney	Lendico
Min.	-77.086	-69.619	-55.327
Max.	366.956	503.151	532.302
Mean	109.588	88.395	113.486
Median	55.326	38.513	0.027
Std.Dev.	157.246	150.226	215.988
Obs.	11	13	7

Table 11: Descriptive Statistics of GR of smava, auxmoney, and Lendico

3.4.2. Granger Causality

Further, we rely on financial literature in which dominant markets are analyzed. Schmidhammer et al. (2014), e. g., study the influence of DAX index futures markets on DAX index products based on a Granger (1969) causality test. We use a Granger causality analysis to test whether a dominant BM can be observed due to dominant GR. In the case of a dominant BM we would expect a one-directional influence from GR of the BM that apply a dominant BM on GR of the BM that apply no dominant BM. Since TA of Lendico increases in 2020 due to the acquisition by ING Germany, we exclude this year to avoid distortions. Our data permit to analyze the bidirectional influence between smava and auxmoney and between auxmoney and Lendico. Due to a low number of common data points, Granger causality analysis is not possible between smava and Lendico. First, we test the bidirectional question of whether GR of smava influences GR of auxmoney and vice versa. Although only nine observations are available, F-statistics and p-values show significant outcomes, which are shown in Table 12. The first hypothesis is that GR of auxmoney does not Granger-cause GR of smava. Both, F-statistic and P-value suggest that the hypothesis that GR of auxmoney does not Granger-cause GR of smava has to be neglected. Hence, GR of auxmoney significantly influences GR of smava. The second hypothesis tested is that GR of smava does not Granger-cause GR of auxmoney. This hypothesis has to be neglected as well. Again, we observe a significant influence, however, in the opposite direction where GR of smava influences GR of auxmoney. Since GR of smava influences GR of auxmoney and vice versa, results suggest that no dominant BM prevails. When we test the bidirectional influence between auxmoney and Lendico, no significant outcome can be observed. Again, results suggest that no dominant BM prevails in the German lending platform market.

H₀: auxmoney GR does not Granger-cause smava GR		H₀: smava GR does not Granger-cause auxmoney GR	
F-statistic	P-value	F-statistic	P-value
6.713	0.041	4.999	0.067
Obs.	9		
H₀: Lendico GR does not Granger-cause auxmoney GR		H₀: auxmoney GR does not Granger-cause Lendico GR	
F-statistic	P-value	F-statistic	P-value
0.697	0.4916	2.123	0.283
Obs.	5		

Table 12: Granger Causality Tests between GR of smava and auxmoney

3.4.3. Growth Rate Differences

Although one cannot observe a dominant design in the German lending platform industry, business model changes can have an impact on the GR of one platform relative to others. Changes in business models are not made randomly and could be seen as an adjustment process towards a dominant industry design. If this is the case, changes in business models should lead to stabilize or increase GR. In our sample, auxmoney decided in 2015, to cooperate with institutional investors. In 2017, Lendico decided to focus on corporate loans. To show, whether business model changes have a relative impact in GR, we illustrate GR means before and after changes in business models. Results are illustrated in Figure 10. One can observe that auxmoney experienced a decrease in average GR from 133 % to an average of 37 % GR after the business model change. Also, Lendico experienced a decrease from 114 % to -26 % after it changed the business model. Although we observe changes in GR over time, decreases in GR mean values after business model changes do not indicate an adjustment process towards a dominant industry design.

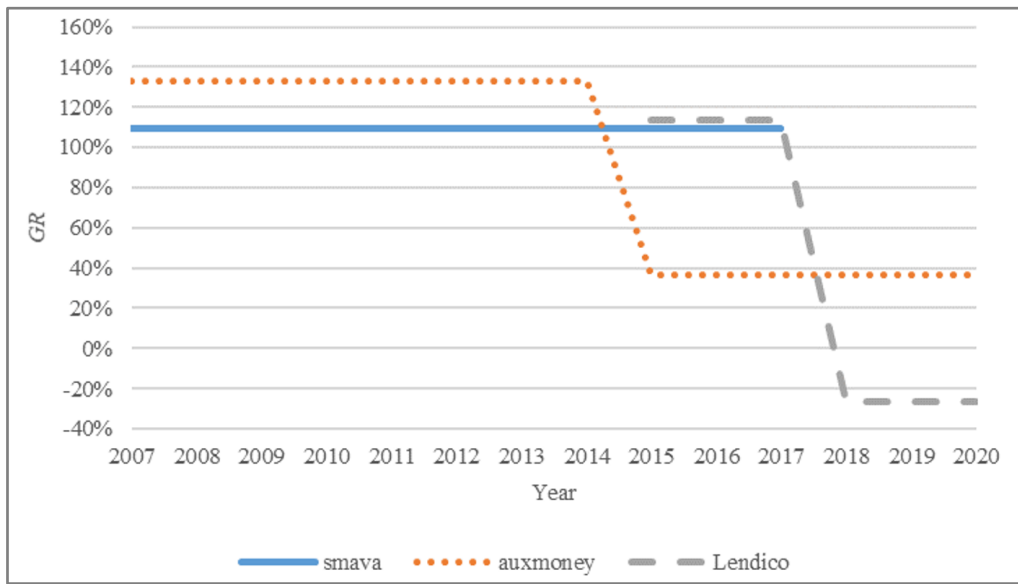


Figure 10: Development of GR (%) Means Before and After Business Model Changes of smava, auxmoney, and Lendico

In order to show whether Figure 10 results are significant, we include differences-in-differences estimation as illustrated in Bertrand et al. (2004). Estimation techniques, e. g., contribute to identify effects before and after political intervention. Based on ordinary least squares (OLS) regression specifications Bertrand et al. (2004) describe the application of differences-in-differences estimation, where the dependent variable is constructed as a panel. The intervention effect can then be captured by dummy variables. Also, fixed effects and individual controls can be included in the analysis. In our sample, we analyze the impact of business model changes on GR. Equation (2) illustrates the OLS regression specification:

$$GR_{i,t} = \beta_0 + \beta_1 \cdot D^{aux} + \beta_2 \cdot D^{len} + \beta_3 \cdot D_{changeBM}^{aux} + \beta_4 \cdot D_{changeBM}^{len} + \varepsilon_{i,t} \quad (2)$$

In this model, the dependent variable $GR_{i,t}$ is structured as a panel. $GR_{i,t}$ represents GR of product i at time t . D^{aux} is a vector of product dummies which is set to 1 in the case of auxmoney and 0 else. Hence, β_1 captures the product specific influence of auxmony before the business model change. D^{len} is a vector of product dummies which is set to 1 in the case of Lendico and 0 else. Coefficient β_2 captures the product specific influence of Lendico before the business model change. GR after business model changes are captured by β_3 for auxmoney and by β_4 for Lendico. The corresponding vectors of

dummy variables $D_{changeBM}^{aux}$ are set to 1 in the case of auxmoney after the business model change and $D_{changeBM}^{len}$ for Lendico accordingly. Since smava is omitted as the reference, the constant term β_0 can be interpreted as smava-specific GR. The error term of product i at time t is represented by $\varepsilon_{i,t}$. We employ Newey and West (1987) to correct for heteroscedasticity and autocorrelations in the sample's residuals. Table 13 illustrates the results.

	Model	
	coeff. ^o (%)	
	(t Stat.)	
Constant	1.096	***
	(3.031)	
D^{aux}	0.232	
	(0.444)	
D^{len}	0.041	
	(0.050)	
$D_{changeBM}^{aux}$	-0.962	**
	(-2.603)	
$D_{changeBM}^{len}$	-1.400	*
	(-1.901)	
Obs.	30	
Adj. R²	-0.034	

^o Significance levels are at 10% = *, 5% = ** and 1% = ***.

Table 13: Business Model Changes on GR

For the constant term, a highly significant value of 1.096 can be observed which can be interpreted as a 110% GR of smava. This corresponds to the value as illustrated in Figure 10. Since D^{aux} and D^{len} are not significant, GR of auxmoney and Lendico do not significantly differ from smava before business model changes. $D_{changeBM}^{aux}$ and $D_{changeBM}^{len}$ coefficients are significantly and negative which means that GR significantly decreases for auxmoney and smava after business model changes. Overall, regression results have to be interpreted carefully when we look at a negative adjusted R². However, the regression results qualitatively confirm Figure 10 results. Furthermore, as a robustness test (not illustrated in the paper) we estimate a regression specification including the different starting points of the lending platforms. These results also qualitatively confirm Table 13 results.

3.5. Discussion of the Mixed Method Analysis, and Conclusions

In this paper, we analyzed the BMs of the major players on Germany's lending marketplaces, smava, auxmoney and Lendico, by using the concept of the BM Canvas of Osterwalder and Pigneur (2010) to identify a tendency towards a dominant BM in this industry in 2016. This qualitative cross-case analysis and our quantitative test of GR of TA show that while the three case study companies started as lending marketplaces, that mediated loans from private individuals to private individuals, they modified their BMs in different directions and no dominant BM exists on lending platforms in Germany in 2016.

Our qualitative study shows that in 2016, all of them pursue another BM variant. While auxmoney still focuses on lending between private persons, but meanwhile also with institutional investors, smava acts as a credit comparison portal. In the process, smava expanded its BM by adding loan offers from partner banks to private lending, which no longer plays a central role in the BM. Lendico also expanded the BM and included companies as borrowers. Therefore, all of them added further customer segments to gain additional sources of revenues and the companies partially occupy different submarkets as a result. Moreover, Lendico has been international since its founding, in contrast to the other companies active in Germany. Through the continuous evolution of BMs, which is evident in the different BMCs of the BM Canvas, the three companies have become increasingly divergent. Strong similarities exist in six of the nine BMCs analyzed: Key Partners, Key Activities, Key Resources, Cost Structure, Customer Relationships, and Channels. All three of the companies use the same possibilities for customer relationships, such as personal and automatic consulting. For a target customer approach, they also use viral channels. All of our investigated lending platforms rely on strategic alliances and partnerships for developing the core business and for further activities, e. g., partners with a banking license for money transactions and developing the algorithm. This results in the same category of cost drivers, mainly to operate and envelop the digital platform and marketing. Three correlating BMCs remain that show sharp distinctions: Customer Segments, Revenue Streams, and Value Proposition. The different Customer Segments explain the different Revenue Streams. Moreover, this leads to different Value

Propositions, where credit range, runtimes, minimum investment sum and returns show further differences between the companies. From the perspective of qualitative analysis, a dominant BM of an industry requires a largely congruence in at least the BMCs Value Proposition, Customer Segments, Customer Relationship, Channels, Revenue Streams, and Cost Structure, which does not apply here.

The diversification of the business models of the three marketplaces strengthened further since 2016. auxmoney briefly introduced corporate loans in 2019 and has focused exclusively on institutional investors only since 2022. smava has been operating exclusively as a comparison portal since 2019 and has listed auxmoney as a partner company. Lendico focused on pure corporate loans in 2017 before being acquired by ING Germany in 2018, where it has been fully integrated into the Business Banking division since 2020.

The quantitative analysis supported the assumption that no dominant BM on the German lending marketplaces has emerged until this point of time. If there would be a dominant BM, we expect that GRs of the TAs of this BM would significantly exceed those of the other BMs or lead to a decrease in the GRs of the dominated BMs. We observed, instead, that GR closely correspond over time. Furthermore, Granger causality analysis showed that GRs are independent or even positively influence each other, which would not be the case if there were a dominant BM. The analysis of GR differences confirms this result since we observe decreases in GR mean values after business model changes. In the case of a dominant design, we would expect changes in business models to stabilize or increase GR.

From the results of the mixed methods analysis, it can be concluded that all three case study companies pursue a different BM variant, and no dominant BM exists in Germany's lending platform industry, even if the companies originally started with a similar BM. This default BM at market entry could have been one of other dominant BMs from other already established markets in other countries. We hypothesize that these BMs could have been adopted by the pioneers of the industry such as Zopa (UK), Prosper, and Lending Club (US). In this context, at the time of market entry smava and auxmoney were based on the BM of Lending Club (C. Berger, 2021; auxmoney, 2014a) while smava's BM

differed in parts from that of Prosper and Zopa (B. Schneider, 2007). Lendico, on the other hand, was based on the BMs of Lending Club and Zopa (Kuepper, 2013). The respective starting points of the German BMs would have to be examined and verified in detail in an international comparison in further research. Therefore, we hypothesize that in Germany, dominant BMs at the time of market entry had to be modified to deliver the expected results. The reasons behind adopting rather identical BMs upon market entry and modifying BMs over time could have a significant impact on the success of the companies in the German lending platform industry.

3.6. Outlook, and Implications

Market developments in the recent low-interest phase are also favoring alternative and increasingly professional ways of lending and investing on lending platforms. It is especially the diversification of the BMs of these platforms that makes it possible, on the one hand, to serve the different demand for alternative ways of obtaining loans, both for private customers and for business customers with ever higher loan volumes. On the other hand, it is obvious that more and more private individuals as well as institutional investors are taking advantage of digital investment methods with calculable risks and correspondingly attractive interest rates. This study can give analysts, entrepreneurs, venture capitalists and managers in established companies an overview of the development of lending platforms in Germany. It helps to build an understanding of how the market has developed and that the emergence of a standard BM must not be a natural outcome for platform models. This could encourage managers to design and innovate fintech BMs more creatively and less in a copy-cat manner.

Our analysis allowed us to advance the nascent discussion on the emergence of dominant BMs on two-sided platforms. We followed the call of Brem et al. (2016), and analyzed the different dynamics of dominant designs in other industries, especially in the service industry. Furthermore, we follow (Zhao et al., 2020) and study the evolution of BMs in two-sided markets. Contrary to the studies of Doganova and Eyquem-Renault (2009), Chesbrough (2010) and McGrath (2010), we could not show that after a transitional phase, a dominant logic prevails in the BMs in the industry of lending marketplaces. We propose that the international dimension of BM evolution in two-sided markets can

explain part of the different development described here. Therefore, we hypothesize that the international dimension is separated into two subfactors: One factor is the difference between lead and follower markets and firm strategies that could explain different BM patterns at least temporarily. The second factor seems to be grounded in heterogeneous market and regulation circumstances that shape the evolution of BMs in different directions. This supports the view that platform BMs do not necessarily need to end up in winner-takes-all market situations when demand heterogeneity comes into play (Shapiro & Varian, 1999). An increasing scientific discourse on the categorization of BMs of lending platforms at the international level also indicates that a differentiation strategy is considered to be more successful rather than entering into a price war (Omarini, 2018; Ziegler et al., 2018). Our findings and explanations raise the following questions that should be considered in further research: Can this behavior also be observed in other countries or industries? Is this behavior also present in other digital platform models? What implications for the theory of standard BMs as a dominant design must be drawn? Are patterns stable over time or a matter of time frame?

3.7. Appendix

As a robustness test, we analyze GR based on the lending volume. For smava, we could gather data between 2007 and 2011 and between 2015 and 2020. For auxmoney we got data between 2008 and 2020. Figure 11 illustrates the results. GR development shows, that smava and auxmoney largely correspond over time as it is the case for GR based on TA, illustrated in Figure 9. Again, a dominant design cannot be observed.

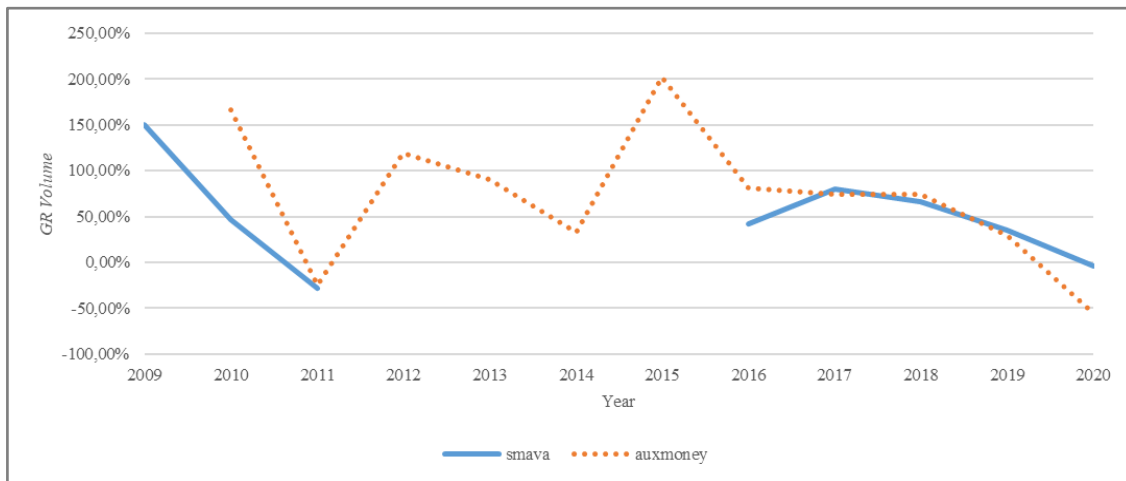


Figure 11: Development of Lending Volume-Based GR (%) of smava and auxmoney

Additionally, we use a Granger causality analysis to test whether a dominant BM can be observed due to dominant volume-based GR. In the case of a dominant BM we would expect a one-directional influence from the (volume based) GR of the BM that apply a dominant BM on GR of the BM that apply no dominant BM. Table 14 shows the result of the Granger causality analysis. When we test the bidirectional influence between auxmoney and smava, no significant outcome can be observed. Again, results suggest that no dominant BM prevails in the German lending platform market.

H ₀ : auxmoney volume-based GR does not Granger-cause smava volume-based GR		H ₀ : smava volume-based GR does not Granger-cause auxmoney volume-based GR	
F-statistic	P-value	F-statistic	P-value
0.449	0.572	1.167	0.393
Obs.		5	

Table 14: Granger Causality Tests between Volume-Based GR of smava and auxmoney

4. Paper 3: Drivers of International Convergence in Digital Two-Sided Platform Markets: The Case of Dominant Business Model Components in Online Lending

4.1. Introduction

The financial industry has undergone significant transformations since the 2008 banking crisis, driven by advancing digitization, networking, and business model innovations with disruptive potential (Borgmeier, 2009; Pur et al., 2022; Floegel & Beckamp, 2020). This is particularly evident in the rise of financial technology companies (FinTechs), which challenge traditional financial services through technology-driven business models (Widyanto et al., 2022; Chen et al., 2021). Online marketplace lending has become one of the fastest-growing segments among various overlapping FinTech subcategories, such as crowdsourcing, mobile payments, and cryptocurrencies. These platforms connect lenders and borrowers, manage repayment obligations, and disrupt the traditional role of banks as financial intermediaries (Widyanto et al., 2022; Chen et al., 2021).

The first online lending marketplace, Zopa, launched in the UK in 2005, followed by Prosper (2006), LendingClub (2007) in the USA, smava and auxmoney (2007) in Germany, and many others worldwide. Since then, marketplace lending has rapidly expanded and has become one of the most prevalent FinTech business models in the UK, the USA, Europe, and China, with strong growth in India, Japan, South Korea, and other fast-growing economies (Chen et al., 2021; Widyanto et al., 2022; Lynn et al., 2019). Peer-to-peer (p2p) lending, the idea of individuals lending money to one another, has existed for centuries in informal settings such as the Friendly Societies in the UK (Omarini, 2018) and neighborhood circles in France (Bednorz, 2020), aimed to promote financial inclusion and empowerment (Omarini, 2018). Modern online lending marketplaces build on this legacy by offering financing to individuals and businesses excluded from traditional banking while enabling financial and social returns for investors (Omarini, 2018; Pur et al., 2022). Over time, however, most marketplaces have shifted from retail investors to institutional capital, with regulatory changes and the

professionalization of the sector contributing to this shift (Davis & Murphy, 2016; Pur et al., 2023; IBISWorld, 2023a).

New markets and technologies often begin with different business models as companies experiment with diverse strategies to meet emerging customer needs (Christensen, 1997; Schallmo, 2014). Over time, as customer preferences become clearer, the various market players adjust their business models accordingly to fit customer expectations and the value network better (Morris et al., 2005; Sosna et al., 2010; Teece, 2010; Demil & Lecocq, 2010; Chesbrough, 2010). As part of this process, external drivers such as regulatory changes, technological advances, and market dynamics play an important role in shaping business models (Bruhn & Hadwich, 2018; Wagner & Kabel, 2018; Nielsen, 2023), although their specific influence has received limited attention so far (Ramdani et al., 2019). Eventually, a temporal ideal business model emerges, perceived as the de facto standard within the industry (Morris et al., 2005; Ramin, 2017). This concept, widely known as the “dominant design,” was originally developed for product and technological innovation (Utterback & Abernathy, 1975).

While dominant design theory is well established from an architectural or technology-oriented perspective (Brem et al., 2016; Simmons et al., 2013), its application to business models remains underexplored, particularly evident in regulated service industries and digital two-sided platform markets (Zhao et al., 2020; Nylund & Brem, 2023; Pur et al., 2023). Understanding these dynamics is crucial, as it enables companies in regulated platform markets such as financial services to adapt their business models to changing customer needs, regulatory requirements, and market structures in a targeted manner.

To address these research gaps, this study examines whether an internationally dominant business model design has emerged since the rise of online lending marketplaces in 2005. Building on the framework of the dominant design theory, we analyze the business model development of the leading online lending marketplaces in the UK (Funding Circle), the USA (LendingClub), and Germany (auxmoney). Our focus is on the building blocks of “customer segments” and “value propositions” from the Business Model Canvas (Osterwalder & Pigneur, 2010), as these are considered critical indicators of product-

market fit (Osterwalder et al., 2014) and are used in the analysis of business model convergence (Pur et al., 2023).

We thus pursue the following research question: How and why do the business models of leading online lending marketplaces differ or converge toward a dominant design internationally or in their home markets?

To address this question, we conducted a longitudinal, comparative multiple-case study, following the methodological framework of Yin (2009) and Eisenhardt and Graebner (2007). We uncover the external factors and strategic choices that drive convergence or divergence by analyzing these marketplaces' historical development and current configurations. The selected countries represent mature online lending markets and share important institutional similarities while differing in terms of regulatory details and investor structures.

Our results show a convergence of business models in the key components of customer segments and value propositions among market leaders in the UK, the USA, and Germany.

This paper contributes to research on dominant designs and business model innovation by transferring the dominant design concept to platform-based business models and proposing a generic process model for the emergence of dominant components in potentially disruptive two-sided platform markets. This model offers a basis for understanding the development of dominant components and anticipating future trajectories of platform-based business models. It highlights the role of external pressures, such as regulation, technological change, and investor dynamics, as underexplored drivers of business model convergence, and shows how these forces can foster upmarket shifts toward higher customer segments. Beyond its theoretical contribution, this study also offers actionable insights for stakeholders navigating platform evolution in regulated financial markets.

The remainder of this paper is organized as follows: Section 2 outlines the theoretical foundations. Section 3 presents the research design, including the case study approach, data sources, and analysis. Sections 4 and 5 provide the case findings and cross-case

comparison. Section 6 develops the theoretical contributions, discusses the practical implications, and introduces the generic model. Section 7 concludes with limitations and future research directions.

4.2. Theoretical Background and Conceptual Foundations

4.2.1. Business Model Innovation and the Emergence of Dominant Designs

Since the mid-1990s, researchers have been discussing the business model concept, with most agreeing that it describes how an organization creates value and generates revenue (Berger & Hess, 2015). This paper adopts the definition of Osterwalder and Pigneur (2010, p. 14), who describe a business model as "the rationale of how an organization creates, delivers, and captures value".

To remain competitive, companies must continuously adapt their business models. Accordingly, research on business model innovation has expanded (Foss & Saebi, 2017; Zhao et al., 2020; Brem et al., 2016). However, scholars differ on how much change qualifies as business model innovation. Foss and Saebi (2017) emphasize this ambiguity, while Ramdani et al. (2019) argue that business model innovation can range from minor adjustments to complete structural reconfigurations. These changes typically affect four domains: value proposition, operational value, human capital, and financial value. Schallmo et al. (2021) highlight that the degree of novelty in business model innovation is primarily assessed from the customer's perspective and results from novel combinations of business model components that create new value for customers and partners.

External factors, such as technological advancements, regulatory requirements, and shifts in consumer behavior, are frequently cited as key drivers of business model innovation (Bruhn & Hadwich, 2018; Wagner & Kabel, 2018; Nielsen, 2023). Although their importance is widely acknowledged, their precise influence, particularly in regulated two-sided platform markets such as online lending, remains underexplored (Ramdani et al., 2019).

When new technologies or markets emerge, customer needs are often unclear, and multiple business models compete to address nascent demands (Christensen, 1997; Teece,

2010; Schallmo, 2014; Bohnsack et al., 2014). Companies respond with radical innovations and adapt their business models iteratively to changing customer preferences and value networks (Morris et al., 2005; Sosna et al., 2010; Teece, 2010; Demil & Lecocq, 2010; Chesbrough, 2010). Over time, a temporarily optimal configuration emerges that aligns with the needs of most market participants and is perceived as the industry standard (Morris et al., 2005; Ramin, 2017). Following Utterback and Abernathy (1975), we refer to this standard as the “dominant design”.

The emergence of a dominant design marks a turning point for the industry (Brem et al., 2016; Ramin, 2017). From this moment on, industry dynamics shift as innovation increasingly focuses on processes rather than products (Anderson & Tushman, 1990; Rosenkopf & Tushman, 1994; Baum et al., 1995; Dodgson et al., 2013; Ramin, 2017). Dominant designs influence technology life cycles and strategic priorities (Srinivasan et al., 2006; Brem et al., 2016), often leading to more efficient product development and a reduced number of competitors (Utterback & Abernathy, 1975; Suárez & Utterback, 1995). Moreover, Brem et al. (2016) empirically demonstrated a negative relationship between the emergence of a dominant design and the overall degree of innovation within an industry.

When applied to business models, the concept of a dominant design implies that successful companies adopt similar structural components that serve as the de facto standard within an industry. Companies that deviate from this configuration typically operate in niche markets (Morris et al., 2005; Schallmo, 2014; Ramin, 2017).

Despite its relevance, the concept of dominant design has primarily been explored in technological or architectural contexts (Brem et al., 2016; Simmons et al., 2013). Its application to business models, especially in two-sided platform markets and regulated service industries, remains underdeveloped (Zhao et al., 2020; Nylund & Brem, 2023; Pur et al., 2023). While recent studies examine standardization in digital innovation ecosystems, they focus mainly on technological, regulatory, or organizational aspects (Nylund & Brem, 2023). The role of business model structures in this context, particularly within two-sided platform markets, remains insufficiently understood.

This gap is particularly relevant for two-sided platform markets in the financial services sector, such as online lending marketplaces, where regulatory frameworks, technological change, and institutional investors' strategic behavior contribute to business model evolution, potentially leading to dominant configurations.

4.2.2. Influence of Disruptive Innovations on Business Models

Disruptive innovations are new offerings that initially fall below established market criteria but open up alternative ways to create value by targeting underserved or previously excluded customer segments (Christensen et al., 2004; Christensen & Raynor, 2003). Over time, these innovations improve and can redefine industry standards and eventually displace established solutions (Christensen, 2006). A key element of this process is the development of novel business models that enable market participants to operate outside traditional structures and attract new demand (Huesig, 2012; Christensen et al., 2015).

This evolution often follows a strategic pattern described in disruptive innovation theory, where entrants begin by serving marginalized market segments but subsequently migrate upmarket by improving their offerings and focusing on more profitable and demanding customer groups (Christensen & Raynor, 2003).

Online lending marketplaces are an example of this development in the financial sector. They initially bypassed traditional banks to serve borrower groups with limited access to credit before evolving into professionally managed marketplaces that integrate institutional capital and challenge established lending models (Pur et al., 2022; Gaar et al., 2021; Temelkov, 2018).

4.2.3. Business Models in Two-Sided Platform Markets

Two-sided platform markets are a distinct type of business model in which a platform mediates between two user groups characterized by mutual attraction and network effects (Parker & van Alstyne, 2005; Pur et al., 2022). A prominent example is online lending marketplaces, which connect borrowers and lenders. While borrowers seek low interest rates, lenders aim for high returns, creating an inherent conflict of objectives (Croll & Yoskovitz, 2013).

Network effects in such platforms can be categorized into direct vs. indirect and same-side vs. cross-side. Direct network effects arise when increasing participation on one side raises value for the same side. Indirect effects occur when complementary products or services attract users (Rochet & Tirole, 2003; Parker & van Alstyne, 2005; Barasinska et al., 2011). Same-side effects boost the value of a group due to its own growth (Parker & van Alstyne, 2005), while cross-side effects mean that growth on one side enhances attractiveness for the other (Rochet & Tirole, 2003; Boudreau & Jeppesen, 2015). These effects are interlinked, increasing management complexity (Parker & van Alstyne, 2005; McIntyre & Srinivasan, 2017). For instance, more borrowers attract institutional investors, raising the need for sophisticated risk management.

A key challenge is the “chicken and egg problem”, where marketplaces have to attract users on both sides at the same time (Croll & Yoskovitz, 2013; Song et al., 2018; Pur et al., 2022). To overcome this challenge, platform operators often focus on the revenue-generating side and treat the other side as financially neutral or deliberately subsidize it to encourage participation (Croll & Yoskovitz, 2013; Song et al., 2018; Boik, 2018). Long-term success requires balancing user growth and monetization strategies (McIntyre & Srinivasan, 2017).

Building on this, two-sided platform markets introduce unique structural dynamics, particularly network effects, that further influence business model evolution and convergence.

4.2.4. Conceptual Framework for Analyzing Business Models and Dominant Designs

A widely used framework for developing and analyzing business models is the Business Model Canvas by Osterwalder and Pigneur (2010), which conceptualizes business models across nine interconnected building blocks (Trabucchi et al., 2019; Khodaei & Ortt, 2019). At its core is “value propositions”, surrounded by “customer relationships”, “channels”, and “customer segments” on one side, and “key resources”, “key activities”, and “key partners” on the other. These are complemented by “cost structure” and “revenue streams” (Osterwalder & Pigneur, 2010).

Recent research identifies “customer segments” and “value propositions” as key to recognizing dominant designs in an industry. Pur et al. (2023) showed this by analyzing three leading German online lending marketplaces. While operational elements such as key resources, key activities, key partners, and associated cost structures were structurally similar, the marketplaces diverged significantly in customer segments and value propositions due to strategic positioning in a common national market. All marketplaces began as providers of private-to-private lending but evolved to serve distinct customer segments with differentiated value propositions, resulting in different revenue streams. In contrast, customer relationships and channels remained largely standardized.

These findings indicate that customer segments and value propositions are central to understanding the convergence or divergence of business models within an industry. This aligns with Ramdani et al. (2019), who highlighted these components as dimensions of business model innovation, and Schallmo et al.’s (2021) customer-centric perspective. It also resonates with the Value Proposition Canvas by Osterwalder et al. (2014), which focuses on these components to ensure a product-market fit.

Building on these insights, this study focuses on customer segments and value propositions as critical indicators for identifying internationally dominant configurations in online lending marketplaces.

4.3. Research Design

4.3.1. Methodological Approach

Our research design is based on the methodological principles of Strang (2015) and combines a post-positivist and pragmatic perspective, enabling a systematic analysis of business model development while considering external influences. This integrated approach ensures methodological clarity and supports the structured assessment of convergence patterns in evolving market contexts. Within this framework, the level of analysis is at the company/organizational level, examining the development of the current leading online lending marketplaces from three key countries where the industry originated: the UK (Funding Circle), the USA (LendingClub), and Germany (auxmoney). These countries were selected because they provide a comparable context, with similarly

developed economies and mature financial markets, that allows us to analyze structural similarities in business model evolution over time.

We apply a multiple/cross-case study approach based on Yin (2009) and Eisenhardt and Graebner (2007) to investigate these dynamics. This method is particularly suitable for our research as it enables an in-depth investigation of real business model developments in their contextual environment. Following Swanborn (2010), we adopt a retrospective perspective and analyze multiple points in time to capture the evolution of business models. This longitudinal approach allows us to track key adaptations and convergence trends in the selected online lending marketplaces. By analyzing these developments across countries, we explore theoretical assumptions about dominant designs and business model innovation and provide a basis for applying these findings to other industries through further case studies or large-scale research.

4.3.2. Data Collection and Reliability

The unit of analysis is the business model of the selected market leaders. We track their evolution and compare qualitative changes with annualized loans from founding to March 2024. This allows us to assess how adjustments in customer segments and value propositions (Osterwalder & Pigneur, 2010; Osterwalder et al., 2014) correlate with market performance. We hypothesize that business model innovation will impact loan volumes positively or negatively and that market leaders' business models will increasingly converge as they adapt to clearer and evolving customer needs.

To ensure validity and reliability, we employ data triangulation, which is a key principle in qualitative research (Yin, 2009; Huberman & Miles, 1994). Our analysis is based on 236 secondary sources, which can be divided into:

- Company publications, including annual reports, press releases, and blogs from the online lending marketplaces.
- External sources, such as entries in the Federal Gazette, industry reports, and published interviews with key players.

The selection criteria for these secondary sources include relevance, credibility, and timeliness to ensure the robustness of our dataset (Strang, 2015). The data and information

extracted from them are cited directly in the study to make the results more comprehensible. Given the transparency of online lending marketplaces, these publicly available sources enable systematic observation and ensure a robust empirical basis. In addition, inconsistencies between sources are cross-validated using multiple independent data sets and a comparative review framework (Strang, 2015).

4.3.3. Data Analysis

The analysis follows a two-stage approach. First, we conduct single/within-case analyses, examining each market leader in its national context to understand the evolution of its business model. Second, we conduct a cross-case analysis, contrasting similarities and differences to gain insights into the mechanisms driving business model convergence or divergence.

The empirical analysis focuses on the two customer-oriented building blocks of the Business Model Canvas “customer segments” and “value propositions,” which serve as the conceptual framework for analyzing the systematic development and convergence of business models (Osterwalder & Pigneur, 2010).

To ensure transparency, we follow Strang (2015) in our multiple/cross-case analysis, systematically mapping business model patterns to validate convergence mechanisms.

Based on this research design, we pursue the following overarching research question:

How and why do the business models of leading online lending marketplaces differ or converge toward a dominant design internationally or in their home markets?

The following sub-research questions guide our single/within-case analyses:

- How has the online lending marketplace industry developed in the respective country?
- How and why has the business model of the respective market leader developed over time?

To operationalize these research questions, we assess the prevailing business model components by combining qualitative case coding and loan volume trends, ensuring a

structured and comparative approach to analyze the standardization of business models across different regulatory and market environments.

The findings from the single/within-case and cross-case analyses form the basis for deriving a generic model that explains the emergence of dominant business model components in potentially disruptive platform-based industries. To enhance clarity and practical applicability, this model adopts a process-oriented visualization inspired by the Business Process Model and Notation (BPMN) principles, providing a structured and intuitive representation of key processes and interactions (Object Management Group, 2010).

4.4. Single Case Studies

4.4.1. Marketplace Lending in the UK: Funding Circle

4.4.1.1. Institutional Framework and Lending Landscape

The UK features a centralized banking system with London as an international financial hub, hosting global institutions alongside regional and local banks (Floegel & Gaertner, 2018). Capital market-based financing and a strong venture capital sector, supported by insurance companies and pension funds, foster innovation (Grimm et al., 2023). Facing growing competition from digital challengers, traditional banks are modernizing their services, often through partnerships or acquisitions of FinTechs such as online lending marketplaces (Statista, 2025a; IBISWorld, 2023b). London also anchors a dynamic FinTech ecosystem that drives alternative lending models (Statista, 2025b; IBISWorld, 2023b).

The Bank of England supervises banks and large financial institutions (Bank of England, 2022). The Financial Conduct Authority (FCA) regulates financial markets and service providers, adheres to the standards of the Basel Committee on Banking Supervision (BCBS), and cooperates closely with European regulators (Financial Conduct Authority [FCA], 2022).

In the UK, genuine p2p lending is well established, allowing direct loan agreements between borrowers and lenders without intermediary banks. In this model, marketplaces

operate under brokerage contracts and generate revenue through commissions (Eberle, 2019).

4.4.1.2. Market Situation and Key Players

The UK online lending marketplace industry comprises 122 providers with a market size of £397.7m (as of August 2023). Funding Circle leads with a 46.8% market share (IBISWorld, 2023b). Market growth is expected to slow down due to consolidation, macroeconomic conditions, and tighter regulations (IBISWorld, 2023a).

Two major competitors exited the marketplace model: Zopa, which fully transitioned to Zopa Bank in 2021 (Zopa, 2022), and Ratesetter, acquired by Metro Bank in 2020 (RateSetter, 2021). In addition, platforms like Lending Works (Harding, 2021) and Assetz Capital (Assetz Capital, 2022) withdrew from the retail investment segment and now focus on institutional lending.

Key drivers of this shift include the impact of COVID-19, declining retail investor participation, and stricter FCA requirements for marketplace operations (Funding Circle, 2022b; Laurence, 2022; Lending Works, 2023). These requirements included, for example, a limitation on retail investment volumes (FCA, 2019). These developments have made marketplace lending less attractive for marketplaces and retail investors although the revised rules are seen to enhance consumer protection (IBISWorld, 2023b). A few niche providers like Folk2Folk still allow retail investments, targeting specific borrower segments such as property developers or farmers (Gaw, 2021).

4.4.1.3. Business Model Development of Funding Circle

Funding Circle was founded in 2010 to provide loans to small and medium-sized enterprises (SMEs) funded by individual investors (Business Loan Companies, 2021; Gaw, 2021). The marketplace targeted a submarket traditionally underserved by UK banks (p2p Lending, 2019). The next year (2011), Index Ventures joined as the first institutional investor (Lomas, 2018). In 2013, the UK government began lending via the marketplace, and Funding Circle expanded into the U.S. market (Peer To Peer Lending UK, 2015). In 2014, it entered the German market (Kühn, 2020). In 2015, it merged with its much smaller German competitor Zencap, which had focused on the continental

European business. At the time, large venture capital funds such as Index Ventures, Union Square, and Accel Partners were backing Funding Circle (Hesse, 2015). The merger with Zencap facilitated Funding Circle's access to the German, Dutch, and Spanish markets, where Zencap was already represented (IT Finanzmagazin, 2015). In 2016, it discontinued its business in Spain and its real estate lending business, which was only available in the UK (Index Ventures, 2018; Wood & Imran, 2019). In 2019, Funding Circle expanded its institutional investor offerings to include a receivables-backed bond program and a UK economic impact fund (Pritchett, 2020b). In 2020, at the onset of COVID-19, Funding Circle paused its retail investment business (Ahkine, 2020) and secondary market offerings (Pritchett, 2020a). In the same year, it ceased operations in Germany (Funding Circle, 2023b) and the Netherlands due to cost concerns (Homefinance, 2020). For German borrowers, it has since referred to the Kreditanstalt für Wiederaufbau's (KfW) domestic funding (Funding Circle, 2023f), and for Dutch borrowers to the Chamber of Commerce and SME funding (Funding Circle, 2023e). In 2021, Funding Circle introduced FlexiPay, a short-term loan product (Funding Circle, 2022a). A year later (2022), it closed its investment business for retail investors (Funding Circle, 2022b). In 2023, it hired the former LendingClub president to expand the U.S. market (Funding Circle, 2023a). The same year, the marketplace no longer accepted applications under the Government Recovery Loan Scheme and referred to Self Employed Loans offered on the marketplace for a certain time (Funding Circle, 2023d). However, it simultaneously partnered with Atom Bank to support SME financing under the revised Recovery Loan Scheme (Funding Circle, 2023i). Additionally, it partnered with Tungsten and PayPoint to extend its reach to UK SMEs (Funding Circle, 2023c) and provided brokers with FlexiPay, enabling borrowers to pay by card or transfer (Funding Circle, 2023g, 2024c). Later in 2023, the Funding Circle loan portfolio was securitized by Waterfall Asset Management, allowing institutional investors to acquire further loans via the asset-backed securities (ABS) market (Funding Circle, 2023h). At the end of 2023, the company announced that it had received an SBA Small Business Lending Company (SBL) license from the U.S. Small Business Administration, enabling it to offer SBA 7(a) small loans in the USA starting in 2024 (Funding Circle, 2023j). 2024 began with a financing partnership with Barclays Bank and TPG Angelo Gordon (Funding Circle,

2024a). Since its founding (as of March 2024), Funding Circle has mediated £16.9 billion to over 150,000 companies (Funding Circle, 2024b).

The business model development described above is accompanied by the following development of originated loans per fiscal year in Figure 12 (All originated loans from the document archive from Funding Circle (2024d); loans include FlexiPay since 2021).

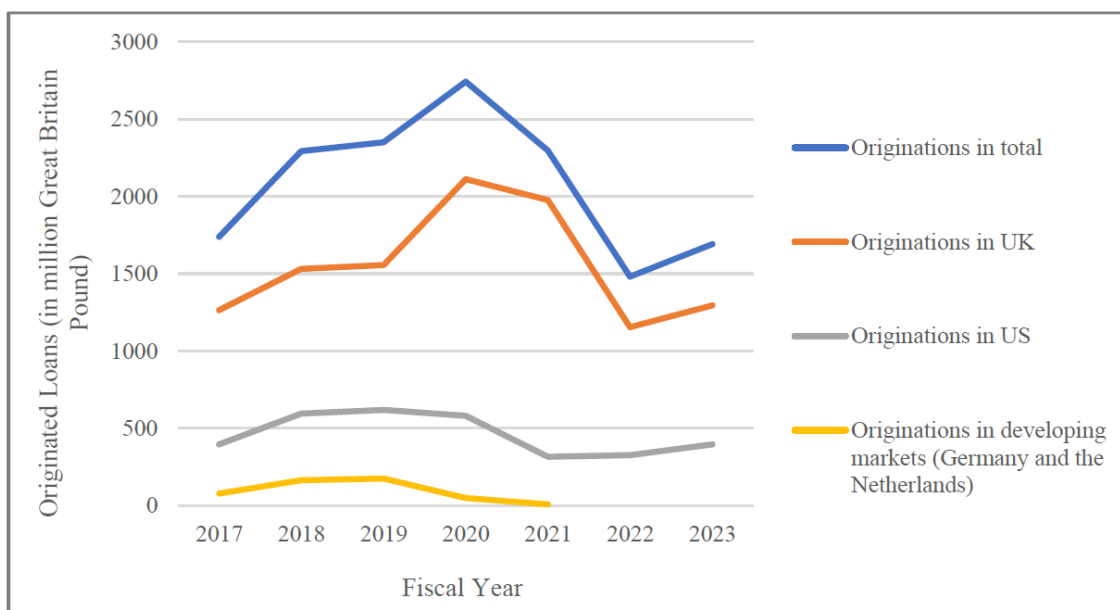


Figure 12: Annual Development of Originated Loans at Funding Circle

Funding Circle has focused on SMEs since it was founded. Institutional investors became involved one year after the company was founded (2011), followed by the British government in 2013. The company's internationalization efforts remained limited: Funding Circle withdrew from continental Europe, and the volume of loans declined in the USA. New products for institutional investors in 2019 appear to have had a positive impact. The business model changed significantly in 2022 with the closure of the retail investor segment. This change became even more pronounced in 2023, marked by increasing loan volumes and new strategic initiatives, including broader institutional partnerships, new payment options, and the securitization of portfolios via the ABS market. The increase in U.S. lending could be due to increased internationalization efforts under the new U.S. leadership.

As of March 2024, Funding Circle exclusively mediates loans from institutional investors to SMEs, a category that now includes the self-employed, freelancers, and founders, although the exact timing of their inclusion is not documented. Loan types differ primarily in terms of amount (from £1,000 to £5 million), maturity (from 3 to 84 months), and interest rate (from 6.9% p.a.). The loan type and conditions depend on the intended use and creditworthiness.

Table 15 shows the current business model (as of March 2024) in the building blocks of customer segments and value propositions.

	Customer Segment	Borrower			Lender	
		SME			Institutional investors	
Value propositions	Loan type	Business Loans*	Government-Backed Recovery Loans (Recovery Loan Scheme)	Asset Finance	FlexiPay	n.n.
	Loan range (in £)	10,000–500,000	25,001–250,000	10,000–5 Mio.	1,000–250,000	n.n.
	Term (in months)	6–72	6–72	6–84	3	n.n.
	Interest rates p.a. (in %)	From 6.9	From 13.7	n.n.	0	n.n.
	Fees	One-off completion fee	One-off completion fee	n.n.	Flat 3% fee on each invoice	n.n.

* Various loans on the same terms, e.g., loans for the self-employed, unsecured loans, working capital loans, loans for limited liability companies

Table 15: Customer Segments and Value Propositions at Funding Circle

4.4.2. Marketplace Lending in the USA: LendingClub

4.4.2.1. Institutional Framework and Lending Landscape

The USA operates a decentralized central banking system, consisting of twelve regional Federal Reserve Banks under the central control of the Federal Reserve Board in Washington (Krause, 1999). The financial market includes major global institutions alongside regional and local banks (Statista, 2025d). Capital and venture capital markets are highly developed, with pension funds and insurance companies as key investors (Grimm et al., 2023). Traditional banks are facing growing competition from FinTech start-ups, which is prompting them to modernize their digital services (Statista, 2025d).

Many are now collaborating with, acquiring, or being acquired by FinTechs such as online lending marketplaces. Innovation hubs such as Silicon Valley and New York play a central role in promoting digital lending and alternative financing models (IBISWorld, 2023c).

Financial supervision is distributed across multiple national authorities. Key institutions include the Federal Reserve Bank of New York and the Board of Governors of the Federal Reserve System, both members of the BCBS (Bank for International Settlements [BIS], 2022).

In the USA, online lending marketplaces generally use a debt-dependent notes model, where a partner bank grants the loan, but the receivable is completely transferred to the marketplace. The marketplace then securitizes the repayment and interest claims by issuing corresponding bonds (Eberle, 2019).

4.4.2.2. Market Situation and Key Players

The online lending marketplace industry in the USA comprises 13 active marketplaces with a total volume of approximately \$1.5 billion (as of September 2023). LendingClub holds the largest market share at 20.8%, followed by Upstart Network (13.3%), On Deck Capital (12.1%), and Prosper (5.3%) (IBISWorld, 2023c).

While LendingClub has evolved into a full-spectrum fintech marketplace bank in 2021 (LendingClub, 2023c), competitors have pursued narrower focuses: Upstart Network mediates Artificial Intelligence (AI)-driven consumer loans via partner banks (Upstart Network, 2024), On Deck Capital specializes in small business financing through brokers and intermediaries (OnDeck, 2023), and Prosper offers personal loans from retail and institutional investors (Prosper, 2023). Consumer loans have declined for platforms in the USA (Tretina, 2022). Due to the widespread use of credit cards, many borrowers use online lending marketplaces primarily for debt consolidation (p2p Lending, 2019).

A key regulatory development was the passage of the California Commercial Financing Disclosure Law in 2019, implementing mandatory disclosure requirements for small business financing, including the annual percentage rate, to increase transparency and borrower confidence (California Legislative Information, 2018). In addition, the ruling in

Madden v. Midland Funding LLC (2015) created legal uncertainty regarding the permissibility of circumventing state usury limits by purchasing bank loans. This led to a decline in marketplace lending and an increase in personal bankruptcies in the affected states (Danisewicz & Elard, 2023).

4.4.2.3. Business Model Development of LendingClub

LendingClub launched in 2007 as a Facebook app and then as one of the first online lending marketplaces in the USA, mediating loans between retail investors and private borrowers (CreditLoan, 2019). One year later (2008), it registered its offerings as securities with the Securities and Exchange Commission (SEC) (SEC, 2008). At LendingClub, the investment amount was distributed in \$25 pieces (called notes) across different loan projects, which were grouped into classes A-F, from low to very high risk/return (LendingClub, 2015b). In 2013, Google acquired shares in LendingClub (Campbell & Levy, 2013), and LendingClub established its first cooperation with smaller banks, Titan Bank and Congressional Bank (Calvey, 2013). The company has permanently adjusted its offerings and strategy over time. For example, in 2014, it introduced super-prime loans for consumers with excellent credit ratings, zero-interest patient financing, and business lending for SMEs through hedge funds and family offices (Weisul, 2014). The company also went public in the same year. In 2015, the company formed strategic partnerships with Google, Alibaba, and BancAlliance (LendingClub, 2015a), and partnerships with the Opportunity Fund (Zacks, 2015) and Sam's Club (Wahba, 2015) to support small businesses. For a simplified investment of online advisors and broker-dealers, "LendingClub Open Integration," an integration of application programming interface services, was launched (LendingClub, 2015c). The following year (2016), LendingClub joined forces with competitors Prosper and Funding Circle to found the Marketplace Lending Association, which advocated for responsible business practices in the industry, among other things (LendingClub, 2016). It also added auto refinancing to its loan offerings (LendingClub, 2017c). That same year, LendingClub fired its former CEO, Renaud Laplanche, due to questionable lending practices and a conflict of interest in one of his personal investments, which shook investor confidence and caused its share price to drop (ValuePenguin, 2016). A year later, in 2017, the company launched the

mobile iOS application “LendingClub Invest” (LendingClub, 2017a), expanded its investor base to include asset managers and banks (LendingClub, 2017b), and closed its first self-funded securitization deal (LendingClub, 2017d). In 2018, after a two-year investigation, the Federal Trade Commission (FTC) filed a complaint against LendingClub for failure to comply with FTC and Gramm-Leach-Bliley Act requirements (LendingClub, 2018a). In the same year, it launched a cooperation with Intuit and Credit Karma to simplify its loan processes and make them more transparent (LendingClub, 2018b). In response to the FTC complaint, LendingClub changed its website in 2019 (LendingClub, 2019a). The company also stopped accepting Class E loans (LendingClub, 2019b), emphasized strong institutional investor growth in consumer loans (LendingClub, 2019c), and introduced new investor products (LendingClub, 2019d). In 2020, LendingClub announced the acquisition of Radius Bank (LendingClub, 2020a), and several adjustments were made due to the COVID-19 pandemic. To minimize overall losses, approval rates for higher-risk borrowers were reduced, applicant screening requirements were increased, and the marketing mix was adjusted (LendingClub, 2020b). Skip-a-pay was introduced for borrowers, late fees were dropped, interest rates were increased, and the focus was on high-credit quality loans (A and B grade) (LendingClub, 2020c). At the end of 2020, LendingClub withdrew the notes platform and closed the retail investor business, as the business model was not considered economically viable in the new setting with Radius Bank (LendingClub, 2023a). The following year (2021), with the completed acquisition by Radius Bank, LendingClub became the first publicly traded U.S. neobank and full-spectrum financial technology marketplace bank (LendingClub, 2023c). In the process, the yacht lending business was closed, and the auto refinance business was expanded, among other things (LendingClub, 2022a). In 2022, services such as “Stackit,” a cashback and rewards program for personal borrowers, were introduced (LendingClub, 2022b). In addition, LendingClub acquired a \$1.05 billion personal loan portfolio from MUFG Union Bank, valued at an estimated expense of \$4 million (LendingClub, 2022c). At this time, the Federal Reserve Bank’s interest rate hikes were reflected in lower market revenues at LendingClub. As a result, it reduced its workforce twice in 2023 by 14% each time and announced cost-cutting and reorganization measures to realign its business activities accordingly (LendingClub, 2023b, 2023e). It also no

longer originates new commercial real estate loans (LendingClub, 2024b). Since its founding (as of March 2024), LendingClub has recorded over 4 million members with over \$90 billion in mediated loan volume (LendingClub, 2024a).

The business model development described above is accompanied by the following development of originated loans per fiscal year in Figure 13 (All originated loans from the document archive from LendingClub (2023d)).

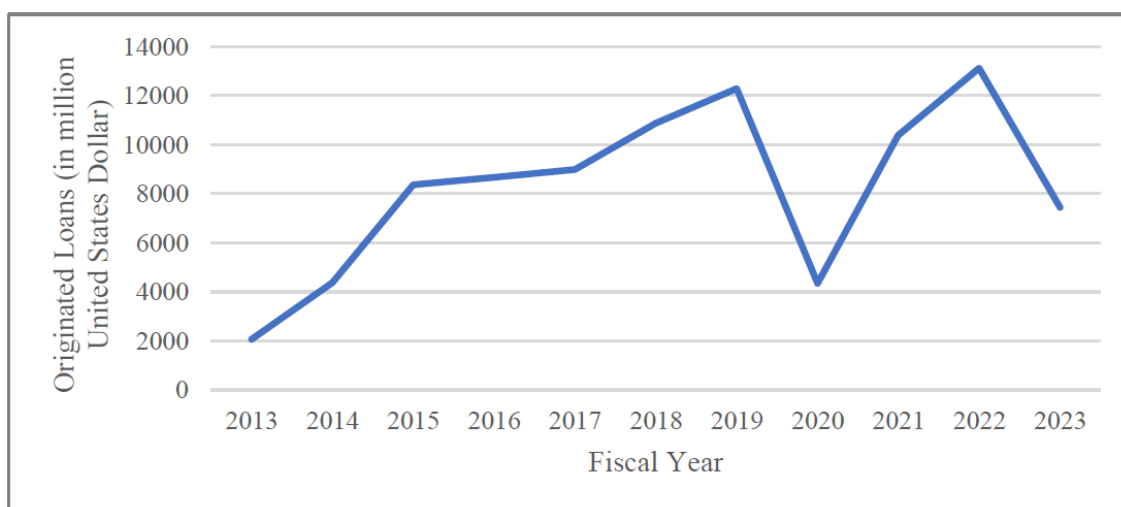


Figure 13: Annual Development of Originated Loans at LendingClub

Increasing professionalization (2014), i.e., in addition to the initial public offering, business customers as a new customer segment, and the start of institutional investors, have given the company a significant boost. The increasing offer for both customer sides and the extension of the investor base favored the development of originated loans until 2019. There was a decline in originated loans in 2020. At the same time, various adjustments were made to the loan offering due to the COVID-19 pandemic, and the company specialized in serving institutional investors only. The following two years (2021 and 2022) showed an upswing in originated loans when LendingClub significantly changed its business model with the acquisition of Radius Bank in 2021. However, this was followed by a decline in originated loans as the company had to undergo considerable cost-cutting and reorganization measures in 2023, such as employee redundancies, to adapt to the more difficult market conditions due to higher interest rates.

As of March 2024, LendingClub operates as a bank and lending intermediary. In the lending business, it mediates various loans from institutional investors to private individuals, medical practices (or patients), and business professionals. The various loan types differ especially in loan amount (from \$500 to \$15 million), term (from 6 months to 25 years), and interest rate (from 0 to 30.99% p.a.). The loan type and conditions depend on the target group, the intended use, and creditworthiness.

Table 16 shows the current business model (as of March 2024) in the lending business in the building blocks of customer segments and value propositions. The banking business is not considered due to the scope of the study.

Customer segment	Borrower									Lender		
	Private individuals		Medical practices/patients				Business professionals			Institutional investors		
	Patient Solutions (via a registered doctor)						Business Loans			n.n.		
Loan type	Personal Loans	Auto Refinancing	Installment Loans*	Revolving Lines of Credit**	Small Business Loans***	Small Business Administration (SBA)						
						SBA 7(a) Loans	SBA 504 Loans	SBA Express Lines of Credit				
Value propositions	Loan range (in \$)	1,000–40,000	4,000–55,000	500–35,000	1,000–65,000	499–32,000	1,000–32,000	5,000–500,000	200,000–5 Mio.	750,000–15 Mio.	Up to 500,000	n.n.
	Term (in months)	24–60	24–84	6–84	6–84	n.n.	n.n.	12–60	Up to 25 years	Up to 25 years	n.n.	n.n.
	Interest rates p.a. (in %)	9.57–35.99	4.99–24.99	0	3.99–30.99	0 for 6, 12, 18, or 24 months, then 26.99	17.90 for 24, 36, 48, or 60 months, then 26.99	n.n.	n.n.	n.n.	n.n.	n.n.
	Origination fees (in %)	3–6	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.

*) by LendingClub Bank

**) by Comenity Capital Bank

***) with Accion Opportunity Fund

Table 16: Customer Segments and Value Propositions at LendingClub

4.4.3. Marketplace Lending in Germany: auxmoney

4.4.3.1. Institutional Framework and Lending Landscape

Germany has a decentralized banking system structured under the three-pillar model, consisting of private commercial banks, public-sector banks, and cooperative banks (Floegel & Gaertner, 2018). Bank financing dominates, while institutional investors such as pension funds and insurers play a minor role. The venture capital market is shaped primarily by international investors (Grimm et al., 2023). In traditional banking, investments in digitalization focus heavily on security and data protection, with banks increasingly expanding online and mobile services and partnering with or acquiring FinTechs and online lending marketplaces (Statista, 2025c).

Germany is part of the eurozone's Single Supervisory Mechanism (SSM), with the European Central Bank (ECB) overseeing major financial institutions. The ECB supervises 120 major institutions, including Germany's largest banks. Smaller and medium-sized banks are supervised by the Deutsche Bundesbank and the Federal Financial Supervisory Authority (BaFin), which coordinate closely with the ECB to ensure alignment with EU-wide regulations (Deutsche Bundesbank, 2014). Financial supervision also extends to financial service providers such as online lending marketplaces and payment companies, which must comply with capital requirements, risk management, liquidity standards, and reporting obligations (European Union, 2019a, 2019b). Germany follows the BCBS framework (BIS, 2022).

In Germany, online marketplace lending follows the assignment model, where a transaction bank enters a loan agreement with the borrower, disburses the loan, and subsequently assigns the receivable to the lender. The purchase occurs before the loan agreement is concluded (Eberle, 2019).

4.4.3.2. Market Situation and Key Players

Germany is considered the second largest market in Europe, with a market share of 17.7% (Schmidt, 2020), with auxmoney as the leading online lending marketplace (auxmoney, 2022b) since it replaced the long-standing market leader, smava, in 2015 (Huesig et al., 2016).

The former main players, auxmoney, smava, and Lendico, initially launched with a private-to-private approach, have changed their business models considerably. auxmoney has relied on institutional investors exclusively since 2022 (auxmoney, 2022a). smava transformed into a pure loan comparison portal in 2019. Lendico has focused solely on business loans since its sale by Rocket Internet in 2017 (Eich, 2017). Acquired by ING Diba in 2018, it has been fully integrated into ING Diba's business banking division for digital SMEs and self-employed lending since 2022 (Schürmann, 2022).

4.4.3.3. Business Model Development of auxmoney

auxmoney began cooperating with SWK Bank in 2008 to process and grant loans between retail investors and private borrowers. Initially criticized for lacking transparency and charging fees before loan conclusion (Stiftung Warentest, 2007), auxmoney introduced major process improvements in 2013 (Skrabania, 2014), cut the cost of loan applications (auxmoney, 2013a), and introduced mobile crowdfunding and the "auxmoney score", a credit rating system that improved funding speed (Schmidt, 2014). In addition, auxmoney began targeting the self-employed and freelancers with its (personal) loans (auxmoney, 2013b). In 2014, it lowered the minimum investment to €25 (auxmoney, 2014b), and welcomed family offices as investors. The next year (2015), the first institutional investor, the insurer Aegon, was taken on board, and auxmoney was added to the Finanzcheck.de comparison portal (auxmoney, 2015d). In 2016, additional institutional investors followed, including ProSiebenSat.1 Media SE (auxmoney, 2016i). The following year (2017), auxmoney expanded partnerships with retail banks, and the direct bank N24 (Klatt, 2017), and introduced digital signatures with Idnow (auxmoney, 2017). In 2019, auxmoney extended its borrower base to include businesses, offering loans up to €750,000 through solarisBank (Klatt, 2019b). That year also saw partnerships with Miles & More (Klatt, 2019a), and international offices in Budapest and Málaga, followed by Dublin in 2020 (A. Lottner, personal communication, January 10, 2024). In 2020, Centerbridge acquired a majority stake, while existing venture capital investors, Index Ventures, Union Square Ventures, and Foundation Capital, stayed on board (Klatt, 2020). The same year, auxmoney entered a financing partnership with BNP Paribas (Klatt, 2021c), began investing on its own online lending marketplace (Klatt, 2021b), and

founded auxmoney Investments to manage funding structures (auxmoney Investments, 2022). auxmoney was aimed specifically at global institutional investors (Klatt, 2021a). In 2021, new investors, including Citigroup, Chenavari (Klatt, 2021b), and Citi (Timw, 2022) joined, and the first ABS was issued (Daniel, 2021). During the year, auxmoney rebounded from COVID-19 with 113% loan growth and 41% revenue growth (R. Johnen et al., 2024). In 2022, it issued its second ABS (Daniel, 2022), gained Natixis as an investor (Timw, 2022), and closed its platform to retail investors (auxmoney, 2022a). A year later (2023), a third ABS followed (Timw, 2023), alongside a majority stake acquisition of leading Dutch competitor Lender & Spender BV (Daniel, 2023), indicating consolidation in Germany's FinTech market (Schwarz, 2023). By 2024, auxmoney had placed four social ABS bonds totaling €1.3 billion (Daniel, 2024), and claims to be Europe's leading digital platform for personal loans (auxmoney, 2024a). Since its founding (as of March 2024), auxmoney has mediated nearly 600,000 loans over €4.5 billion (auxmoney, 2024b).

The development of the business model described above is accompanied by the following development of originated loans per fiscal year in Figure 14 (All originated loans from the auxmoney press archive (Klatt, 2018), and after consultation with auxmoney).

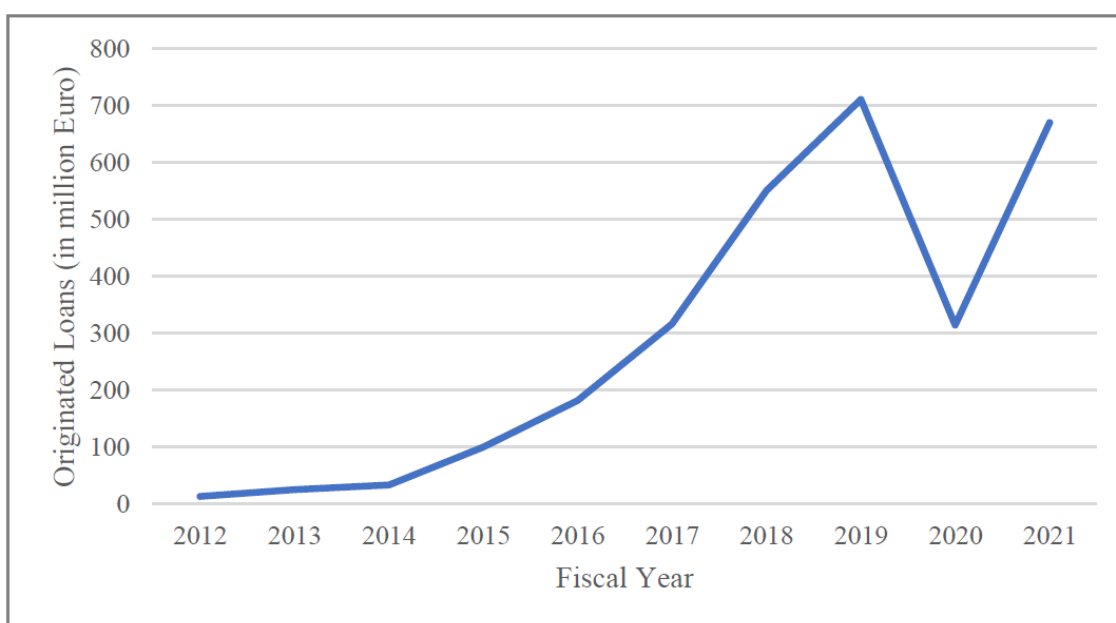


Figure 14: Annual Development of Originated Loans at auxmoney

Following its expansion to the self-employed and freelancers as borrowers (2013), family offices (2014), and institutional investors (2015), originated loan volumes rose significantly. A temporary business loan offer in 2019 and the international expansion in 2019-2020 were followed by a pandemic-related decline in 2020, despite strategic investments and partnerships. From 2021, ABS issuances and investor growth marked a new scaling phase although auxmoney no longer reports any new loan volumes.

As of March 2024, auxmoney mediates loans from institutional investors and auxmoney itself to private individuals, SMEs, the self-employed, freelancers, and founders. All apply for the same personal loan product (from €1,000 to €50,000, from 12 to 84 months), with conditions depending on the intended use and creditworthiness.

Table 17 shows the current business model (as of March 2024) in the building blocks of customer segments and value propositions.

	Customer segment	Borrower		Lender	
		Private individuals	SME	Self-employed, freelancers, and founders	Institutional investors
Value propositions	Loan type	Personal Loans	Corporate Loans (not a separate product, it's personal loans)		n.n.
	Loan range (in €)	1,000–50,000	1,000–50,000		n.n.
	Term (in months)	12–84	12–84		n.n.
	Interest rates p.a. (in %)	n.n.	n.n.		n.n.
	Fees	Ø 3.5% of the net loan amount	Ø 3.5% of the net loan amount		n.n.

Table 17: Customer Segments and Value Propositions at auxmoney

4.5. Cross-Case Analysis

4.5.1. Institutional Framework and Lending Landscape

While the UK, the USA, and Germany follow the BCBS framework, their banking structures, regulatory approaches, and lending models differ. The UK operates a centralized banking system with London as a global financial hub, the USA follows a decentralized structure with twelve Federal Reserve Banks, and Germany adheres to a three-pillar banking model, where public and cooperative banks play a major role (Floegel

& Gaertner, 2018). Capital markets are most developed in the USA and the UK, supporting active institutional investor participation, while Germany's more conservative market has slowed this transition. Banks in all three countries increasingly act as marketplace investors, driven by regulatory requirements (e.g., Environmental, Social, and Governance [ESG] criteria) and access to new borrower segments. Some platforms, like LendingClub (the USA) and Zopa (the UK), acquired banking licenses, while others, such as Lendico, have been absorbed into traditional banks such as ING-DiBa (Germany).

Despite the alignment with BCBS standards, supervisory intensity varies. Germany's EU-based oversight is considered stricter than in the UK or the USA, particularly regarding capital requirements (Haselmann & Tröger, 2021), whereas the more liberal USA approach contributes to the global reach of its investment banks (Goodhart & Schoenmaker, 2016). Regulatory tightening across all countries has improved transparency and investor protection, but limited retail investor participation. Alongside advances in data analytics and credit scoring, this has driven the professionalization and scaling of marketplaces, making them more attractive to institutional investors and accelerating the transition from p2p to peer-to-incumbent (p2i) models.

The lending models also reflect these national differences. In the UK, genuine p2p lending is permitted, in the USA, a debt-dependent notes model with partner banks is used, and in Germany, an assignment model with fronting banks (Eberle, 2019). Despite these structural differences, all three countries maintain a comparable regulatory focus through international coordination.

4.5.2. Market Situation and Key Players

The online lending marketplace industry has matured significantly in all three countries, although there are signs of consolidation and a slowdown in growth momentum. The UK market remains highly fragmented but is dominated by Funding Circle, which holds almost half the market share despite growing competition and declining active marketplace numbers. In the USA, LendingClub leads a smaller group of major players and has evolved into a full-service marketplace bank. In Germany, the market is more consolidated, with auxmoney becoming the dominant marketplace after competitors such as smava and Lendico modified or abandoned their original models.

Overall, the online lending market is becoming more concentrated in each country, with the leading marketplaces moving away from person-to-person lending and increasingly focusing on institutional investors or positioning themselves as banks.

4.5.3. Business Model Development

All three marketplaces began with a p2p model, with retail investors funding borrower groups unserved by traditional banks. While auxmoney and LendingClub initially focused on consumer loans, Funding Circle positioned itself as a provider of SME loans from the outset. Over time, all three marketplaces integrated institutional investors. Responding to increasing regulatory requirements, the growing importance of larger transaction volumes, and the need for more professional risk management and transparency, they progressively phased out access for retail investors and increasingly shifted toward serving more demanding and sophisticated customer groups on the investment side.

The development of the business models described above, focusing on shifting customer segments, is accompanied by the following development of originated loans per fiscal year across all three marketplaces, as shown in Figure 15 (for a more detailed view of the figures and data, see the single cases).

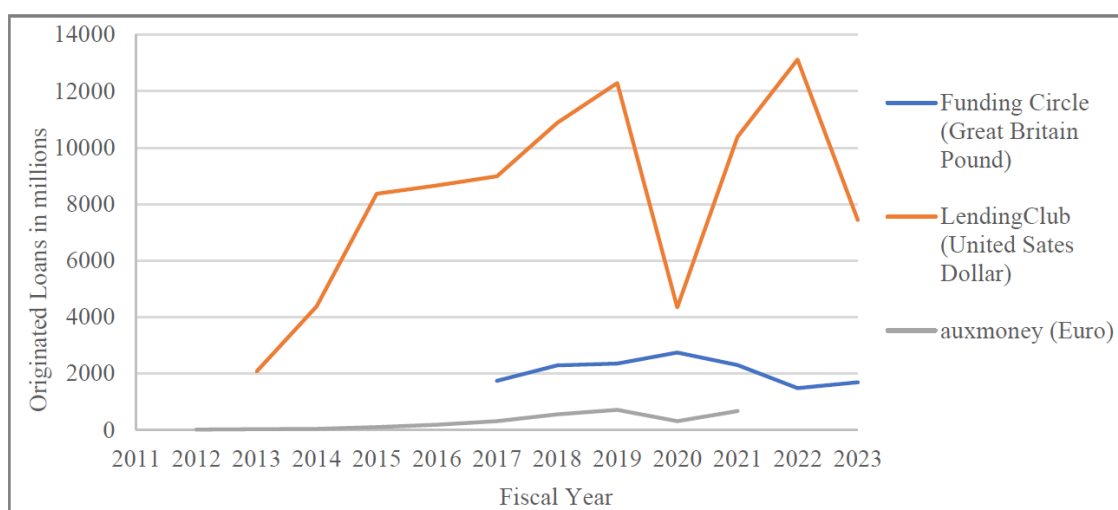


Figure 15: Annual Development of Originated Loans in Comparison

All three marketplaces significantly increased their originated loans after onboarding institutional investors: Funding Circle in 2011, LendingClub in 2014, and auxmoney in 2015. Funding Circle and auxmoney showed notable growth after closing their retail investment businesses (2022 and 2021), while LendingClub's development reflects this shift (2020) and its subsequent integration of banking operations (2021). In both the UK and the USA, government-backed loan programs have further strengthened institutional participation. Funding Circle is part of the UK's Recovery Loan Scheme and holds an SBA license in the USA, while LendingClub offers SBA 7(a), SBA 504, and SBA Express credit lines under U.S. federal programs.

The expansion of the borrower segments followed a differentiated path. LendingClub's loan volumes rose as it broadened access to new customer types in 2014, while auxmoney temporarily saw a decline when adding business loans in 2019 and discontinued the offering shortly after. However, loans for the self-employed have been available as personal loans since 2013 at auxmoney. Funding Circle has consistently focused on SME lending.

Table 18 shows the customer segments currently addressed by the three market leaders (as of March 2024).

Customer Segment	Borrower					Lender	
	Private individuals	SME	Self-employed, freelancers, and founders	Medical practices/patients	Further business professionals	Retail investors	Institutional investors
auxmoney	X	X	X	-	-	Closed 2021	X (since 2015, since 2014 Family-Offices)
Funding Circle	-	X	X	-	-	Closed 2022	X (since 2011)
LendingClub	X	X	X	X	X	Closed 2020	X (since 2014)

X = applies

- = does not apply

Table 18: Customer Segments in Comparison

All three marketplaces now focus exclusively on institutional investors and offer loans to SMEs, the self-employed, freelancers, and founders. Although auxmoney also offers personal loans, LendingClub addresses a much broader customer base, including medical

practices/patients, business professionals, and diverse bank customers, after it acquired Radius Bank in 2021.

For further analysis, Table 19 presents the three marketplaces' value propositions aligned to the shared customer segment (SME, the self-employed, freelancers, and founders) (as of March 2024).

	Funding Circle				LendingClub			auxmoney	
		Government- Backed Recovery Loans (Recovery Loan Scheme)	Asset Finance	FlexiPay	Small Business Loans	SBA 7(a) Loans,	SBA 504 Loans	SBA Express Lines of Credit	Corporate Loans (not a separate product, it's personal loans)
Loan type	Business Loans*								
Loan range	£10,000– £500,000	£25,001– £250,000	£10,000– £5 Mio.	£1,000– £250,000	\$5,000– \$500,000	\$200,000– \$5 Mio.	\$750,000– \$15 Mio.	Up to \$500,000	€1,000– €50,000
Term	6–72 months	6–72 months	6–84 months	3 months	12–60 months	Up to 25 years	Up to 25 years	n.n.	12–84 months

Table 19: Value Propositions in Comparison

The comparison reveals that auxmoney offers the smallest loan range (€1,000–€50,000), Funding Circle a much wider (£1,000–£5 million), and LendingClub the widest (\$5,000–\$15 million). Terms are relatively similar for auxmoney (12–84 months) and Funding Circle (3–84 months), whereas LendingClub offers much longer terms (12 months–25 years), reflecting its broader loan spectrum. Interest rates and fees vary widely by country and lender and are therefore not included in this comparison. The value propositions reflect the strategic positioning and structural differences between national markets.

4.6. Discussion

4.6.1. Interpretation of Results

Our analysis shows an increasing convergence of the central business model components “customer segments” and “value propositions” of all three marketplaces. Despite different national contexts and original orientations, Funding Circle, LendingClub, and auxmoney have evolved from p2p models with retail investors to professionally managed, institutionally funded marketplaces. While the customer segments differ in detail, all

three now focus on previously underserved borrower groups, especially SMEs, the self-employed, freelancers, and founders. At the same time, the market has consolidated. A few large platforms now dominate in every country, while smaller competitors have exited the market or fundamentally changed their business models. This development may mark a turning point, indicating the emergence of a dominant design in business model components of online lending marketplaces.

This change was driven by increasing regulatory requirements, particularly regarding investor protection and transparency, as well as technological advances in credit scoring and data analysis. As a result, all marketplaces excluded retail investors between 2020 and 2022. Institutional capital has become the new standard, enabling scalability and aligning with regulatory expectations.

Capital market structures also influenced investor engagement. Institutional participation gained momentum in the USA and the UK due to more developed markets, while the conservative environment in Germany slowed this shift. Banks also became marketplace investors to mitigate disruption and meet (i.e. social) ESG targets. Thus, they assume a dual role by shaping market conditions externally as incumbents while participating directly in the marketplace model. Public lending programs reinforced this trend: Funding Circle participates in the UK Recovery Loan Scheme and holds a U.S. SBA license, while LendingClub offers SBA-backed loans under federal programs. The marketplaces now act as financial intermediaries and policy instruments for targeted SME lending. However, the exclusion of retail investors limits broader participation in alternative finance.

External and investor-driven changes shape business model convergence and reinforce an emerging upmarket pattern: a gradual move toward more profitable and demanding customer groups. All three marketplaces progressively moved away from fragmented retail investor bases toward institutional investors with higher expectations for professionalism and transparency. For instance, LendingClub acquired a banking license to strengthen its service portfolio, Funding Circle expanded and professionalized its SME lending operations under regulatory frameworks, and auxmoney implemented securitization structures to attract institutional capital. In this evolution, online lending

marketplaces professionalized their operations and increasingly adopted elements of incumbent banking models, such as regulatory compliance, standardized risk management, and banking licenses. This development is consistent with early analytical projections about the disruptive potential of online lending marketplaces (Pur et al., 2022).

Borrower segments have evolved differently across the three marketplaces. Funding Circle has consistently focused on SMEs, reflecting the structural weaknesses in UK banks' lending to small businesses. LendingClub has expanded its borrower base to include private customers, medical practices, tradespeople, and bank customers since the acquisition of Radius Bank. auxmoney, on the other hand, briefly introduced business loans but discontinued its offering. Today, it targets the SME segment with personal loans. Despite national differences, the core segments of borrowers on the marketplaces overlap.

The marketplaces converge into a dominant configuration: digital, scalable, and institutionally supported lending models serving underserved borrower groups. While some local differences remain, structurally similar components have emerged internationally.

4.6.2. Generic Model for Dominant Business Model Components

Based on our analysis, we propose a generic, process-oriented model explaining how internationally dominant business model components can emerge in potentially disruptive two-sided platform markets. The model illustrates how diverse initial national business models undergo adaptation through external drivers and iterative innovation, leading to the international convergence of specific business model components (Figure 16). It is based on the case analysis of Funding Circle (the UK), LendingClub (the USA), and auxmoney (Germany) and integrates theoretical concepts from the business model, platform, and disruptive innovation literature (e.g., Osterwalder & Pigneur, 2010; Foss & Saebi, 2017; Parker & Van Alstyne, 2005; Christensen & Raynor, 2003). The focus is on the customer-centric building blocks “customer segments” and “value propositions,” whose international convergence signals the emergence of dominant components.

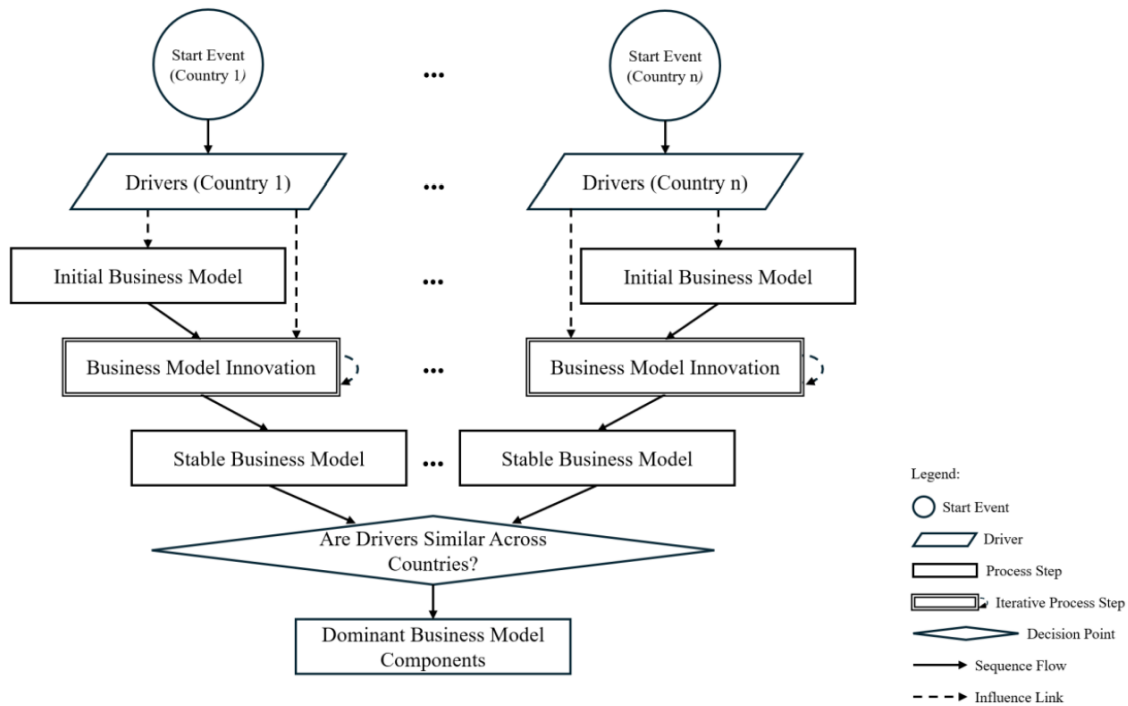


Figure 16: Generic Model of International Dominant Business Model Component Emergence

The process begins with *Start Events* that describe the initial contextual conditions in each country and favor the market entry of potentially disruptive marketplace players. Examples include technological change (e.g. Web 2.0), social openness to new financial intermediaries (the UK), declining trust in banks (the USA), or structural gaps in retail banking (Germany). These conditions led to country-specific *Drivers* such as regulatory changes, technological advances, and market dynamics, which often influence and reinforce each other. Funding Circle, for example, benefited from the FCA’s regulatory framework, while LendingClub illustrates the early adoption of Web-based technologies with its Facebook app, and auxmoney was strongly influenced by cooperation constraints with partner banks.

Based on this, *Initial Business Models* were created that varied greatly between countries and within a country. This heterogeneity reflected different regulatory frameworks and uncertain assumptions about customer needs. While auxmoney and LendingClub initially focused on p2p financing between retail investors and private borrowers, Funding Circle addressed SMEs at an early stage. The variation corresponds to the early phase in the dominant design theory (Utterback & Abernathy, 1975; Brem et al., 2016) and is

consistent with the theory of disruptive innovation, where entrants initially serve underserved or previously untapped customer segments (Christensen & Raynor, 2003; Christensen et al., 2004; Anthony et al., 2008).

Over time, marketplaces adapted their business models to increasingly clear customer needs and to their value network (Morris et al., 2005; Sosna et al., 2010; Teece, 2010; Demil & Lecocq, 2010; Chesbrough, 2010). In addition to refining their fit with customer needs, the marketplaces exhibited an emerging upmarket pattern (Christensen & Raynor, 2003), primarily by shifting toward more attractive institutional investors investor segments, while continuing to target underserved borrower groups. This process of *Business Model Innovation* is iterative and largely driven by external influences. Technological advances in data analysis and scoring have improved risk management. Regulatory requirements such as increased transparency obligations and investor protection measures complicated the involvement of retail investors. At the same time, increasing competition, in which banks also became actively involved, increased the pressure to professionalize. The marketplaces responded by, e.g., auxmoney implementing ABS structures and extending its range of loans, LendingClub expanding its medical financing and acquiring a banking license, and Funding Circle differentiating its SME portfolio. During this development, all three marketplaces ended their retail investor business and switched entirely to institutional investors.

This process continues until a temporarily dominant business model configuration emerges that serves most customers, becoming established as a *Stable Business Model* in the national context. While prior studies suggest that a uniform configuration tends to prevail within industries over time (Morris et al., 2005; Schallmo, 2014; Ramin, 2017), Pur et al. (2023) cannot confirm this for the German online lending market. Due to the specific competitive situation, the business models of the market leaders are strongly differentiated.

If similar external drivers act in different countries, this can lead to the development of *Dominant Business Model Components* at an international level. The cases examined show corresponding convergences that indicate such an emergence. While Funding Circle continues to focus exclusively on SME loans, which is the most underserved borrower

group in the UK, auxmoney combines loans for SMEs and private borrowers, and LendingClub has expanded its model to include banking services after the acquisition of Radius Bank. Despite these partially local differences in customer segments and value propositions, structural similarities exist. All three marketplaces now focus exclusively on institutional investors and serve SMEs as borrowers. This convergence of business model components supports theoretical perspectives on business model standardization and the emergence of dominant configurations in an international context (Morris et al., 2005; Schallmo, 2014; Ramin, 2017).

4.6.3. Theoretical Contributions

This study advances theoretical understanding in three key areas: the extension of the dominant design theory to the business model level, the emergence of component-level business model convergence in international platform markets, and the role of external drivers in shaping business model innovation across countries.

First, we contribute to the literature on dominant designs by extending this concept beyond its traditional technology- or architecture-based perspective (Simmons et al., 2013; Pur et al., 2023; Brem et al., 2016) to the business model level. Our findings show that internationally dominant business model components can emerge in potentially disruptive two-sided platform markets, where convergence is driven by comparable external forces such as regulatory changes, technological advances, and market dynamics. Instead of full business model standardization, we observe convergence at the level of the customer-oriented components, customer segments and value propositions across different national contexts. Furthermore, by applying dominant design theory in a regulated service industry, this study extends its conceptual scope beyond the predominantly technological contexts addressed in prior research (Brem et al., 2016).

Second, this study extends existing research on platform business model evolution (Zhao et al., 2020) and standardization processes in digital platform markets, which have focused primarily on technological, organizational, or regulatory dimensions (Nylund & Brem, 2023). By identifying the convergence of business model components shaped by external forces, we broaden the understanding of how platform ecosystems evolve under comparable conditions. While previous studies discuss the emergence of uniform

business model configurations over time (Morris et al., 2005; Schallmo, 2014; Ramin, 2017), and recent research highlights national differentiation due to competition and multi-homing (Pur et al., 2023), our findings suggest that component-level standardization can occur internationally, particularly when similar market conditions prevail and market leaders operate in parallel rather than in direct competition.

Third, we advance research on external drivers of business model innovation (Ramdani et al., 2019) by demonstrating how regulatory changes, technological advances, shifting customer preferences, and systemic competitive pressures can interact to generate convergent patterns of business model development across countries.

4.6.4. Practical Implications

Our results show several practical implications for policymakers, banks, FinTechs, online lending marketplace operators, institutional and retail investors, and borrowers.

Policymakers have contributed significantly to the shift from p2p to p2i lending models, particularly through stricter investor protection regulations. A better understanding of convergence mechanisms can support the development of future regulations that balance innovation, competition, and financial stability, including regarding global sustainability goals and ESG criteria.

Banks are no longer just observers, but investors, partners, and competitors. As institutional investors, banks benefit not only from strategic access to online lending marketplaces but also from aligning with ESG-oriented regulations that position these investments as part of a broader sustainability agenda. At the same time, they must reposition themselves in a financial ecosystem where online lending marketplaces are increasingly becoming banks.

FinTechs and marketplace operators must adapt to institutional standards in the areas of risk assessment, transparency, and regulatory compliance while maintaining national differentiation. At the same time, the movement of online lending marketplaces into the main market of traditional banks is once again leaving a gap in the lower market segment, opening opportunities for niche providers, social lending models, and new disruptive players.

Institutional investors benefit from professionalized, standardized marketplaces, which enable larger investments, stable returns, and manageable risks. While institutional capital improves access to credit for underserved groups, excluding retail investors increasingly limits opportunities for broader financial participation.

Borrowers benefit from larger loan volumes, improved scoring systems, and more transparent conditions. As marketplaces professionalize and expand their offerings, underserved segments, such as SMEs and the self-employed, gain better access to credit.

4.7. Conclusion

4.7.1. Summary of Key Findings

Online lending marketplaces have developed into a potentially disruptive force in the global banking industry. As in other industries, it was expected that a dominant business model configuration would emerge among successful marketplaces operating beyond niche segments (Morris et al., 2005; Schallmo, 2014; Ramin, 2017). Our analysis of market leaders in key growth markets where the industry originated (the UK, the USA, and Germany) reveals a clear convergence in the key business model components, customer segments and value propositions, which are considered critical for customer-centric business model innovation (Schallmo et al., 2021) and product-market fit (Osterwalder et al., 2014). This convergence occurs independently across national contexts under comparable regulatory frameworks, despite differences in supervisory models, market structures, and intermediation mechanisms. While local distinctions remain, structurally similar business model components have emerged internationally, indicating the emergence of a dominant design at the component level.

All three market leaders examined, Funding Circle (the UK), LendingClub (the USA), and auxmoney (Germany), increasingly aligned their business models around the same core segments after years of iterative innovation shaped by regulatory tightening, technological advances, and changing market structures. Today, all three serve SMEs, the self-employed, freelancers, and founders, and rely entirely on institutional capital. The convergence observed is not driven by direct competition but by parallel responses to similar external pressures.

While national convergence was not observed due to competitive dynamics and multi-homing (Pur et al., 2023), our findings reveal a clear alignment of dominant business model components across national contexts. This convergence is accompanied by increasing market concentration, with a few dominant platforms prevailing in each country. This contributes to advancing theories on dominant design and business model standardization in international platform markets (Brem et al., 2016; Morris et al., 2005; Simmons et al., 2013).

Based on these findings, we propose a generic model for the emergence of internationally dominant business model components in potentially disruptive two-sided platform markets. The model highlights the central role of external forces in shaping convergence and addresses research gaps by extending dominant design theory to business models, analyzing external pressures as drivers of innovation, and illustrating how convergence can occur despite national fragmentation.

4.7.2. Limitations and Further Research

This study has several methodological, conceptual, and data-specific limitations that also point to directions for further research.

As a qualitative case study, the findings are not directly transferable to other platform markets or industries. The analysis focuses on three leading online lending marketplaces in developed economies (the UK, the USA, and Germany). Future research should test the proposed generic model in other geographic contexts, particularly in emerging markets, and under different regulatory or economic conditions. Application to other platform types could reveal whether internationally dominant business model components are also emerging beyond the financial sector. Quantitative studies may help empirically validate the model and its underlying assumptions.

While this study emphasizes the convergence of business model components, it does not address the transition from product to process innovation, a central element in dominant design theory. Further research could investigate whether similar mechanisms apply in other service-oriented platform markets and identify appropriate indicators for these transitions.

Macroeconomic and cultural factors, such as interest rate policy or national financial preferences, were only indirectly considered in our analysis, yet they may significantly influence business model innovations. Extending the model to include such structural or contextual variables could enhance its explanatory power and applicability across different platform contexts.

Finally, the reliance on publicly available secondary data limits insight into online lending marketplaces' strategic decision-making processes. Future studies should integrate primary data sources, such as expert interviews with marketplace operators, regulators, or institutional investors, to better understand business model development and strategic adaptation.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the author(s) used ChatGPT, Grammarly, and DeepL to improve language and readability. After using these tools, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

5. Conclusion

In my dissertation, I investigated how a framework can be developed and applied to assess the disruptive potential of online lending marketplaces (Research Question 1) and how and why a dominant business model has emerged at online lending marketplaces (Research Question 2). Each of the three papers in my dissertation addressed specific research questions that contributed to answering the overarching research questions. By combining research on disruptive innovation, digital two-sided platforms, business model innovation, and dominant designs, I was able to gain a comprehensive understanding of the assessment, forecast, and development of potentially disruptive business models and their evolution toward dominant business model designs at the component level.

In this concluding chapter, I present the findings and contributions of my research. In Section 5.1, I summarize the main findings of the three papers and their contribution to answering my overarching research questions. In Section 5.2, I discuss the contributions to research and in Section 5.3 the implications for practice, each in different areas. In Section 5.4, I point out the limitations of my research and formulate the need for further research. Finally, my concluding remarks follow in Section 5.5.

5.1. Summary of Main Findings

My research contributes to understanding the assessment of disruptive potential and the emergence of dominant business models at online lending marketplaces. The first paper answered Research Question 1. Research Question 2 was addressed in Paper 2 from a national perspective and further refined in Paper 3 by examining selected business model components in an international context.

Table 20 provides a structured summary of the main findings of the three papers. The subsequent paragraphs explain these results in more detail.

Paper 1	Paper 2	Paper 3
<i>Research Question 1</i>	<i>Research Question 2</i>	<i>Research Question 2</i>
Development, application, and validation of an ex-ante framework for analyzing potentially disruptive innovations at digital two-sided platforms	Lack of a dominant business model at leading online lending marketplaces in Germany	Tendency toward a dominant business model design in selected components at international level
Varying degrees of disruptive potential per market side, disruption phase, and heterogeneous market participants	Divergence in business model development despite similar starting points	Convergence in “customer segments” and “value propositions” across market leaders driven by external factors
Investment market side as a strategic weakness for online lending marketplaces	Similarities in the business model components relating to the shared industry structure	Increasing industry concentration and declining competition
Shift from peer-to-peer to peer-to-incumbent models	Differences in the business model components “Customer Segments,” “Revenue Streams,” and “Value Proposition”	Shift to institutional capital and upmarket movement of major online lending marketplaces
Movement of online lending marketplaces into the main market of traditional banks	Confirmation of the absence of a dominant business model through quantitative analysis	Role of banks as institutional investors in counteracting disruption and supporting ESG goals
Expansion of the value network of online lending marketplaces and increasing competition with direct banks		Exclusion of retail investors and reduced sustainability orientation of major online lending marketplaces
		Opportunity for differentiation strategies in underserved market niches
		Development of a generic, process-oriented model for the emergence of internationally dominant business model components

Table 20: Overview of the Main Results of the Three Papers

In the **first paper**, following a comprehensive literature review, we developed, applied, and validated a framework for the ex-ante assessment of the disruptive potential of digital two-sided platforms, based on the work of Keller and Huesig (2009) and extensions by Kaltenecker et al. (2013). This framework was applied to online lending marketplaces in Germany using a case study approach according to Yin (2009), based on secondary data from various sources and expert triangulation. It enables the quantification of disruptive potential as a general measure, separated by market sides, disruption phases, and heterogeneous market participants. Its applicability was confirmed by validating predictions made in 2015, based on data from 2007 to 2015, with data from 2019.

Our analysis showed that the disruptive potential varied by market side, disruption phase, and type of market participant. Notably, the disruptive potential on the credit market side was significantly higher than that on the investment market side, which proved to be a strategic weakness for online lending marketplaces. Traditional banks not only defended but expanded their market share on the investment side. This development transformed the original peer-to-peer model⁴ of online lending marketplaces into a peer-to-incumbent model increasingly dominated by incumbents on the investment market side. This was particularly evident at smava, whose disruptive potential was significantly lower than that of auxmoney in 2015 and had dropped to zero by 2019, as the company had evolved into a pure loan comparison and brokerage portal.

The analysis of data from 2015 and 2019 showed that online lending marketplaces increasingly entered the main market of traditional banks. From 2015 to 2019, the disruptive potential on both sides of the market decreased in the “Foothold Market Entry” phase, while it increased in subsequent phases (“Mainmarket Entry” and “Failure of Incumbents”). At the same time, forecast uncertainty declined, enabling more reliable predictions. We anticipated this development in 2015 and confirmed it in 2019.

Our analysis also revealed that online lending marketplaces expanded their value networks and thus increasingly compete with direct banks. smava, for example, targeted

⁴ In this model, a loan is mediated between a private borrower and one or more retail investors via an online lending marketplace (Belleflamme et al., 2015; Faßbender, 2012; O. Johnen & Goebel, 2010).

new customer segments and has been operating exclusively as a comparison and brokerage portal between loan seekers and banks since 2019. auxmoney, by contrast, expanded its service portfolio and optimized its technology. This enabled borrowers to obtain higher loan amounts, while lenders benefited from improved credit risk assessments. auxmoney also broadened its business model to include business customers and institutional investors. By 2019, auxmoney had more customers than Germany's second-largest direct bank, DKB, while ING Germany was the largest. Nevertheless, the gap to traditional branch and major banks remained substantial and failure was not expected, mainly due to different value networks, particularly regarding customer structures and loan amounts.

In the **second paper**, we analyzed the business model development of the largest German online lending marketplaces, smava, auxmoney, and Lendico, using the concept of the Business Model Canvas by Osterwalder and Pigneur (2010) to examine whether a dominant business model has emerged in this industry. The analysis was carried out using a qualitative cross-case analysis according to Yin (2009) and Eisenhardt and Graebner (2007) as well as quantitative tests of total asset growth rates according to Entrop et al. (2015), a causality test according to Granger (1969), and a difference-in-difference estimation according to Bertrand et al. (2004). The analysis included secondary data from various sources covering the period from 2016 to 2022.

The results showed that no dominant business model has emerged in the German online lending industry, which contradicts the previous theories on the emergence of standard business models based on the concept of dominant designs according to Morris et al. (2005), Ramin (2017), and Schallmo (2014). Although the qualitative analysis revealed that all three companies began with a similar approach, mediating loans from retail investors to private individuals, they developed different business model variants over time. auxmoney introduced corporate loans in 2019 and has focused exclusively on institutional investors since 2022. smava has operated exclusively as a comparison and brokerage portal between loan seekers and banks since 2019. In 2017, Lendico focused purely on corporate loans before being acquired by ING Germany in 2018 and fully integrated into its Business Banking division in 2020.

The analysis using the Business Model Canvas by Osterwalder and Pigneur (2010) showed similarities in six of the nine building blocks, which are mainly based on the shared industry structure: “key partners,” “key activities,” “key resources,” “customer relationships,” “distribution channels,” and “cost structure.” However, differences were identified in the building blocks “customer segments,” “income streams,” and “value propositions,” which were reflected in the loan amounts, interest rates, and loan terms offered. These differences in customer segments and value propositions led to different income streams.

The quantitative analysis supported the qualitative findings. The analysis of total asset growth rates revealed closely aligned growth patterns among the three companies, indicating that none of them has established a dominant business model. The Granger causality tests showed that the growth rates were either independent or positively influenced each other, further suggesting the absence of a dominant business model. Additionally, the difference-in-difference estimation confirmed that business model changes did not lead to a stabilization or increase in growth rates, thereby contradicting the expected pattern for a dominant business model design.

In the **third paper**, we analyzed the development of online lending markets in the UK, the USA, and Germany to examine whether a dominant business model configuration is emerging internationally. The analysis covered both the general market evolution and the specific business model developments of the market leaders Funding Circle (the UK), LendingClub (the USA), and auxmoney (Germany). We conducted a cross-case analysis following Yin (2009) and Eisenhardt and Graebner (2007), focusing on the “customer segments” and “value propositions” building blocks from the Business Model Canvas by Osterwalder and Pigneur (2010). The analysis was based on data from the founding of each online lending marketplace up to 2024.

Our analysis revealed a clear convergence in these business model components across all three market leaders. This convergence reflects an industry-wide development driven by external factors such as regulation, technological advancements, and market dynamics and was accompanied by increasing industry concentration and declining competition. Despite national differences in supervisory structures and intermediation mechanisms,

the online lending marketplaces independently evolved toward similar configurations in “customer segments” and “value propositions” under comparable regulatory frameworks. This convergence did not result from direct competition but emerged as a parallel response to similar external pressures. These developments mark a turning point in the industry and indicate the emergence of an internationally dominant business model design at the component level.

All three market leaders provide loans to small and medium-sized enterprises, the self-employed, freelancers, and founders. auxmoney additionally offers personal loans, while LendingClub moreover serves bank customers following its acquisition of Radius Bank in 2021. On the investor side, all three market leaders have completely transitioned from retail to institutional capital, which correlates positively with loan volumes. This strategic shift reflects an upmarket movement of online lending marketplaces toward more profitable customer segments, enabling more scalable, stable, and professionalized business models. Several major marketplaces entered the main market of traditional banks, with some such as LendingClub and Zopa becoming banks themselves or being acquired by banks. These findings confirm the ex-ante predictions made in Paper 1.

As institutional investors, banks can mitigate disruption by investing in potentially disruptive business models and contribute to Environmental, Social, and Governance (ESG) goals by funding underserved customer groups. At the same time, the retreat from retail investors reduced the online lending marketplaces’ original social and economic sustainability orientation. However, differentiation strategies in underserved niche segments may offer promising growth opportunities for smaller and specialized marketplace operators.

Based on our findings, we derived a generic, process-oriented model that illustrates how external drivers shape the emergence and evolution from nationally (potentially disruptive) business models to internationally converging configurations with dominant components. The model explains how convergence in “customer segments” and “value propositions” of the respective market leaders can emerge across similarly developed countries, even when national divergences persist due to multi-homing and local competition.

5.2. Contributions to Research

My dissertation contributes to the academic discourse on disruptive innovation, digital two-sided platforms, business model innovation, and dominant designs. The following sections present these contributions in direct alignment with the three identified research gaps and provide valuable input for advancing existing theories and methods.

5.2.1. Contribution to the Ex-Ante Assessment of Disruptive Innovations in Digital Two-Sided Platforms

My dissertation contributes to closing Research Gap 1, which refers to the lack of a validated framework for the ex-ante assessment of disruptive potential in digital two-sided platforms (Christensen et al., 2018; Kammerlander et al., 2018; Madjdi & Huesig, 2011; Habtay, 2012; Habtay & Holmén, 2014).

Our developed and validated framework in Paper 1 builds on Keller and Huesig (2009) and extensions by Kaltenecker et al. (2013). It represents a significant advancement by enabling a more differentiated ex-ante assessment that reflects the specific characteristics of digital two-sided platforms. These include the structural heterogeneity of market sides and participants as well as the dynamics of platform-specific network effects, which were missing in prior approaches. It also considers the different phases of the disruption process and refines disruption-specific criteria that are particularly relevant in digital two-sided platforms.

To address these aspects, we applied the framework separately to each market side, allowing a side-specific assessment of disruptive potential, reflecting the distinct business model configurations on each market side. In addition, we aggregated heterogeneous market participants into homogeneous groups, enabling clearer differentiation and improved comparability between user types.

Furthermore, our framework considers same-side and cross-side network effects, which are critical for platform growth and user retention. It also incorporates a phased disruption model adapted to digital two-sided platform environments. This phase modeling enables a long-term forecast that identifies the development over time and critical transition points of market disruption.

We made several conceptual refinements: we removed the criterion “coordination costs” due to its limited relevance in digital platform contexts, consolidated resource-related aspects under “strategic resources are accessible,” and introduced the new criterion “incumbent has no experience in successfully dealing with disruptive threat,” reflecting Christensen et al.’s (2004) “disruptive black belt” concept.

Multiple applications of this framework enable the tracking of changes in disruptive potential over time. Although the framework was developed for online lending marketplaces, its design allows application to other two-sided platform industries.

5.2.2. Contribution to the Understanding of Business Model Development in Digital Two-Sided Platforms

My dissertation contributes to closing Research Gap 2, which refers to the lack of research on business model development in the context of digital two-sided platforms (Zhao et al., 2020).

Our research provides novel insights by analyzing the development of online lending marketplaces in the UK, the USA, and Germany. In Paper 2, we applied the Business Model Canvas by Osterwalder and Pigneur (2010) to examine the business models of the three leading marketplaces in Germany. Our results show that the building blocks related to the industry structure, such as key partners, key resources, and cost structure, are largely comparable. In contrast, the customer-centric and product-market-fit-related “customer segments” and “value propositions” revealed significant national divergence.

In Paper 3 we further explored this divergence by extending the analysis to include the UK and the US markets. This divergence is partly driven by local competition and the ability of both investors and borrowers to engage with multiple online lending marketplaces simultaneously. As a result, marketplace operators develop unique selling propositions to position themselves competitively and attract distinct customer groups.

Moreover, our findings suggest that incumbents can mitigate the risk of disruption by actively responding to and investing in disruptive change, which in turn influences the business model development of online lending marketplaces. We predicted and validated

this development in Paper 1 using our ex-ante framework and empirically observed it in Papers 2 and 3.

In addition, we contribute to research on external drivers of business model innovation (Ramdani et al., 2019) by demonstrating how regulatory changes, technological advances, and market dynamics influence business model development. Our findings show that such external factors can create comparable conditions across countries, thereby promoting convergence in the business model development of digital two-sided platforms. In our international comparison, we identified a clear convergence in the business model components “customer segments” and “value propositions” across the respective market leaders.

5.2.3. Contribution to the Research on Dominant Business Models in Regulated Service Industries

My dissertation contributes to closing Research Gap 3, which refers to the lack of research on dominant business model designs in regulated service industries (Simmons et al., 2013; Schallmo, 2014; Ramin, 2017).

A significant contribution is the application of the technology- and systems-oriented concept of dominant designs to online lending marketplaces as a regulated service industry. The findings are closely related to those of Research Gap 2 as both gaps are addressed by answering the shared Research Question 2. In Papers 2 and 3, we showed that the convergence of “customer segments” and “value propositions” is critical for the emergence of dominant business model configurations.

At the national level, no dominant business model has emerged in the UK, the USA, or the German market, which is due to multi-homing and intense competition in domestic markets. Nevertheless, these national markets show signs of increasing consolidation, with a declining number of competitors and growing market concentration.

At an international level, however, the business models of the respective market leaders are converging in the components “customer segments” and “value propositions,” particularly through a shared upmarket shift and a growing focus on institutional investors. The findings highlight how similar external factors across countries can create

comparable conditions that facilitate the emergence of dominant business model components internationally.

My dissertation shows that while earlier research suggests the emergence of a uniform standard business model over time (Morris et al., 2005; Schallmo, 2014; Ramin, 2017), business model development in online lending marketplaces instead reveals national divergence alongside international convergence at the component level when similar external conditions prevail and market leaders operate in parallel rather than in direct competition.

Another significant contribution is the generic, process-oriented model we developed in Paper 3. Derived from the cross-country comparison, it describes the development of national, potentially disruptive business models into internationally dominant configurations at the component level. It provides a valuable conceptual foundation to analyze how similar external influences and strategic actor behavior may lead to dominant business model components and cross-country convergence dynamics. Along with the ex-ante framework from Paper 1, this model was developed for potential disruptive digital two-sided platforms in the financial sector. Its design allows transferability to other regulated platform-based service industries.

5.3. Implications for Practice

The findings of my dissertation offer practical implications for various players in the financial market, including policymakers, traditional banks, FinTechs and online lending marketplaces, as well as lenders and borrowers.

5.3.1. Implications for Policymakers

The ex-ante framework developed, applied, and validated in Paper 1 provides policymakers with a tool to anticipate developments in the financial sector and other industries affected by potentially disruptive innovations. It helps anticipate disruption phases and supports the design of timely and targeted regulatory measures.

In addition, the results on business model convergence from Papers 2 and 3 provide valuable insights into the early assessment of market shifts and long-term industry

dynamics. These insights support the development of guidelines and regulations that balance innovation, competition, and financial stability.

As shown in Paper 3, regulatory measures, such as investor protection, have significantly contributed to the shift from peer-to-peer to peer-to-incumbent models. Understanding such dynamics is essential for aligning future regulations with broader policy goals, such as financial inclusion and ESG compliance.

5.3.2. Implications for Traditional Banks

Online lending marketplaces increasingly compete with banks, especially direct banks, or have even become banks themselves. The ex-ante methodology developed in Paper 1 enables banks to identify and forecast potential disruptive developments at an early stage and to adapt their business models accordingly. Particular attention should be paid to the customer segments and value propositions of online lending marketplaces and other FinTechs, as these were identified in Papers 2 and 3 as crucial for business model convergence and the emergence of dominant business model configurations at an international level. This also includes monitoring upmarket movements, such as the shift toward institutional investors, which may indicate strategic repositioning and potential long-term competitive threats.

Banks can also benefit strategically from cooperating with online lending marketplaces and other FinTechs or acquiring them to access new customer segments and innovative technologies. In addition, investments in these marketplaces can generate returns while supporting social sustainability goals.

5.3.3. Implications for FinTechs and Online Lending Marketplaces

Our analysis of business model developments in Papers 2 and 3 shows that a focus on institutional investors has emerged as a central trend. This enables larger investment volumes, more stable income streams, and increasing professionalization. As highlighted in Paper 1, the investment market side represents a critical weak point for online lending marketplaces in terms of disruptive potential. Addressing this strategically is therefore essential. The findings of my dissertation can support online lending marketplaces and FinTechs more generally in identifying such critical areas and aligning their strategic

responses accordingly. To remain competitive, they must align their offerings, processes, and structures with the expectations of institutional investors and establish clear unique selling propositions. Technological innovations, such as Big Data and Artificial Intelligence, can be used to optimize the lending process, enhance credit assessments, and improve risk management, thereby generating competitive advantages.

While institutional investors have become the primary target group, the exclusion of retail investors has left a gap at the lower end of the market. This creates opportunities for specialized online lending marketplaces and FinTechs to serve underserved segments or enter niche markets. As shown in Papers 2 and 3, such differentiation strategies can represent promising approaches for positioning in competitive markets, especially as large online lending marketplaces increasingly move upmarket into the main banking market. Cooperations with banks or the development of in-house banking solutions can additionally support growth and long-term customer retention. Despite the increasing international convergence of business model components, national differentiation remains a crucial strategic lever, especially regarding regulatory frameworks and specific customer needs.

5.3.4. Implications for Lenders

For institutional investors the main advantages lie in benefiting from market growth and investing in larger loan projects backed by professional scoring and risk management systems, resulting in calculable risks and stable returns. Our ex-ante analysis approach developed in Paper 1 enables institutional investors to assess the disruptive potential of online lending marketplaces early and align their investment strategy accordingly. Papers 2 and 3 further show that the international convergence of business model components contributes to a more standardized and predictable environment for institutional investments.

Retail investors have largely been excluded from the major online lending marketplaces. As shown in Paper 3, this reduces opportunities for broader financial participation. Nevertheless, there are still options for this group to invest via specialized online lending

marketplaces that continue to serve this segment. As online lending marketplaces continue to evolve, new models may emerge that reopen opportunities for retail investors.

5.3.5. Implications for Borrowers

As shown in Paper 1, online lending marketplaces have increasingly entered the main market of traditional banks, offering new financing opportunities for borrower groups that were previously underserved. The professionalization and increasing regulation of these marketplaces create several advantages for borrowers, especially private individuals, the self-employed, and small and medium-sized enterprises.

Papers 2 and 3 show that the shift toward institutional investors has led to larger loan volumes and increasing standardization of marketplace structures. This benefits borrowers with higher financing needs and increases competition, which can result in more flexible credit terms. In addition, stricter regulation improves transparency, particularly regarding fees and loan conditions, providing borrowers with a clearer overview of the total cost of credit. Some online lending marketplaces have even become banks themselves, enabling them to offer additional banking products beyond traditional loans.

5.4. Limitations and Need for Further Research

My dissertation has several limitations that offer starting points for future research. These limitations result from the applied methodology and the selected data. Table 21 provides a structured overview of the limitations and the corresponding research needs, which are discussed in more detail in the following subsections. Further descriptions of limitations and research needs in the context of the individual papers are provided in Section 2.5 for Paper 1, in Section 3.6 for Paper 2, and in Section 4.7.2 for Paper 3.

Category	Limitation	Need for Further Research
Methodology	Limited generalizability of findings to other online lending marketplaces, countries, and platform-based industries due to the case study approach	Examination of the business models of market leaders in other countries and industries to validate and refine the ex-ante framework and the generic, process-oriented model
	Lack of breadth due to the case study approach	Application of quantitative methods , including Big Data and machine learning, to capture broader market and business model development
	Focus on business model convergence and industry dynamics to indicate a dominant design	Identification of indicators for the transition from product to process innovation and its role in dominant design formation in the service industry
Data	Focus on secondary data	Inclusion of primary data , such as expert interviews, to gain deeper insights into strategies and internal processes of online lending marketplaces
	Limited consideration of external factors , such as macroeconomic and cultural aspects	Systematic integration of macroeconomic and cultural factors into analysis and forecasting to improve accuracy regarding market dynamics and long-term business model development

Table 21: Overview of Limitations and Need for Further Research

5.4.1. Limitations and Need for Further Research due to the Applied

Methodology

Limitation 1: Due to the case study approach, the generalizability of the findings to other online lending marketplaces, countries, and platform-based industries is limited. Paper 1 examined the disruptive potential of the two leading German marketplaces (smava and auxmoney) in the retail banking context. Paper 2 focused on the business model development of smava, auxmoney, and Lendico, while Paper 3 extended the geographical scope to the leading marketplaces in the UK (Funding Circle), the USA (LendingClub), and Germany (auxmoney). Despite this expansion, the findings are limited to their specific market conditions and regulatory environments and are not directly transferable to other countries. Moreover, in emerging markets with low banking density, growth dynamics may differ significantly (Havrylchyk et al., 2020; Oh & Rosenkranz, 2022).

Need for further research 1: Future research should validate and refine the ex-ante framework and the generic, process-oriented model developed in this dissertation by analyzing the business models of market leaders in similarly developed countries and in follower markets such as India or China. This could help identify country-specific patterns and reveal how business models evolve in different regulatory and market environments. In addition, the framework should be applied to other platform-based industries, such as streaming or hospitality, to test its generalizability and explanatory power.

Limitation 2: The case study approach focuses on a real context and analyzes it in detail. This qualitative research method provides valuable insights, but these insights are limited in scope and breadth. In particular, this method does not provide for analyzing the disruptive potential and business model development of online lending marketplaces across larger and more dynamic data sets. A broader view of market participants and industry dynamics is not adequately represented.

Need for further research 2: Future research should also make greater use of quantitative methods and larger data sets to enable more comprehensive coverage and broader generalizability of results. The use of Big Data methods and machine learning could help to capture the dynamics of business models more accurately and enable more precise forecasts.

Limitation 3: In my dissertation, a possible dominant design was identified based on business model convergence, decreasing competitive intensity, and increasing market concentration. However, the transition from product to process innovation, which is often considered another characteristic of a dominant design, was not explicitly examined.

Need for further research 3: Future research should identify specific indicators for the transition from product to process innovation in the service industry and investigate the role of business model components in this process.

5.4.2. Limitations and Need for Further Research due to the Selected Data

Limitation 1: My dissertation is based on the analysis of secondary data obtained from publicly available sources such as annual reports and the Federal Gazette. In Papers 1 and

2, data availability and quality were rated as very good due to the transparent communication of the examined online lending marketplaces and their accessibility in the German market. However, in Paper 3, where we conducted an international comparison between the UK, the USA, and Germany, relevant data was not always complete or easily accessible, particularly regarding institutional investors. This constrained the analysis and limited the understanding of the strategic decisions of the marketplace operators.

Need for further research 1: To enhance the explanatory power of the research results, future studies should complement secondary sources with primary data, such as expert interviews. In particular, interviews with representatives of the analyzed online lending marketplaces could significantly enhance data availability and deepen the understanding of investor strategies and marketplace positioning.

Limitation 2: While Paper 3 considers regulatory changes, technological advances, and market dynamics as external drivers of business model development, broader macroeconomic and cultural influences, such as interest rate policy and national financial preferences, were not systematically examined across the dissertation. As a result, certain cross-country differences and long-term developments may not be fully reflected.

Need for further research 2: Future research should systematically integrate macroeconomic and cultural factors into the analysis and forecasting of business models, thereby refining and extending the ex-ante framework and the generic, process-oriented model developed in my dissertation. This would enable a more differentiated understanding of how national conditions influence the disruptive potential and the emergence of dominant business model configurations.

5.5. Concluding Remarks

In my dissertation, I investigated how a framework can be developed and applied to assess the disruptive potential of online lending marketplaces and how and why a dominant business model has emerged in this context. Drawing on the concepts of disruptive innovation, digital two-sided platforms, business model innovation, and dominant design, I combined qualitative and quantitative methods across three papers to address the identified research gaps and answer the overarching research questions.

My research contributes to a deeper understanding of the evolution of potentially disruptive innovations and the development of business models in regulated platform-based service industries. The ex-ante framework we developed in Paper 1 enables a differentiated assessment of the disruptive potential across disruption phases, market sides, and heterogeneous market participants, while accounting for network effects. Papers 2 and 3 identify national divergence but international convergence in the business model components “customer segments” and “value propositions” of leading online lending marketplaces. Based on these findings, we derived a generic, process-oriented model that explains how regulatory changes, technological advances, and market dynamics drive convergence in international digital two-sided platform markets.

Taken together, these contributions form a coherent and empirically grounded toolkit to analyze and anticipate the development of potentially disruptive platform-based business models. While the results are derived from the case of online lending marketplaces, the underlying mechanisms and approach may be transferable to other industries shaped by similar platform dynamics and regulatory environments.

By synthesizing these insights, my dissertation contributes not only to research on disruptive innovation, business model development, and dominant designs but also offers actionable guidance for key stakeholders. It enables policymakers to act proactively, traditional banks and online lending marketplaces to adapt their strategies accordingly, and investors to make more targeted investment decisions. Considering strong capital markets in the UK and the USA, and the increasing activity of international investors in Germany, further growth and transformation in the banking sector can be expected.

As online lending marketplaces are becoming incumbents themselves, new business models targeting underserved retail investors may represent the next wave of disruption, underscoring the continued importance of anticipatory toolkits such as the one developed in my dissertation.

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