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Towards a Theory on Dominant Business Model Emergence of Marketplace Lending in Germany

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Abstract

In this paper, we analyze the business models of Germany's biggest lending platforms smava, auxmoney, and Lendico to identify a standard business model as a dominant design in this industry. We use a mixed method approach in which a case study at firm level is conducted to analyze and contrast the business models together with their business model components. This qualitative analysis is complemented with a quantitative test of their total asset annual growth rates to triangulate the qualitative analysis. The results indicate that all three companies started with a similar approach but evolved over time into entirely different business model variants. This seems to contradict the previous theory of the emergence of standard business models and dominant designs. At first glance, an increasing convergence of business models over time into a standard business model in the German lending platform industry was not consistent with our results. However, we suggest to explain this contradiction by taking a closer look at the global context of the industry. The origin of lending platforms was pioneered outside the German market by firms such as Zopa (UK) or later Prosper and Lending Club (USA). We hypothesize based on initial evidence that the German lending platforms have largely adopted the business models of the early movers and later modified them according to their local value network such as local market, regulation, and competition conditions. Thereby we propose that the deficient standard business model as a dominant design or a winner takes all market outcome in the lending platform industry might depend on localized demand and regulative heterogeneity.

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JEL Classification: G23, G51, L11, L84, M13, O16, O33, P45

Abbreviations:

BM	business model
BMC	business model component
FinTech	financial technology company
GR	annual growth rates
OLS	ordinary least squares
TA	total assets

I. 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; *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* 2020). 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/Schumann* 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; *de Roure* et al. 2021). 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/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/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/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 1 illustrates this approach.

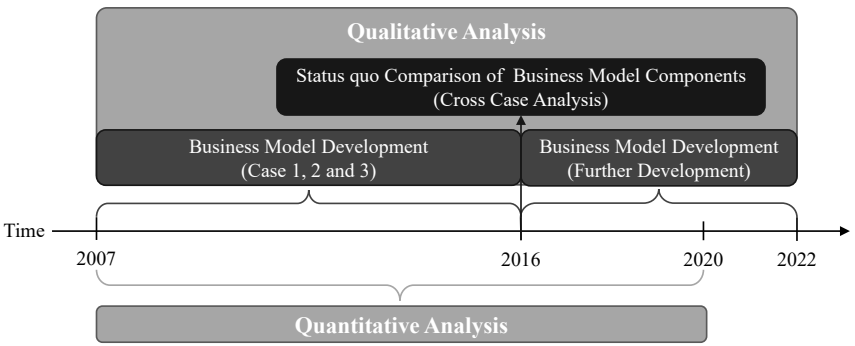

Figure 1: Time sequences of the qualitative and quantitative analyses

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.

II. Theoretical Framework

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 sill prevail (e. g., *Stewart/Zhao* 2000; *Applegate/Collura* 2000; *Afuah/Tucci* 2001; *Osterwalder/Pigneur* 2010; *Weill* et al. 2011; *Zott* et al. 2011; *Bieger/Knyphausen-Aufseß* 2011; *Weiner* et al. 2010). According to *Berger/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; *Trabucci* et al. 2019; *Ghezzi* et al. 2013, 2015; *Trimi/Berbegal-Mirabent* 2012). In this context, according to *Trabucci* et al. (2019), the BM Canvas by *Osterwalder/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/Pigneur* (2010) provides the basis for our study and discussion in this paper.

Osterwalder/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 2, 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.

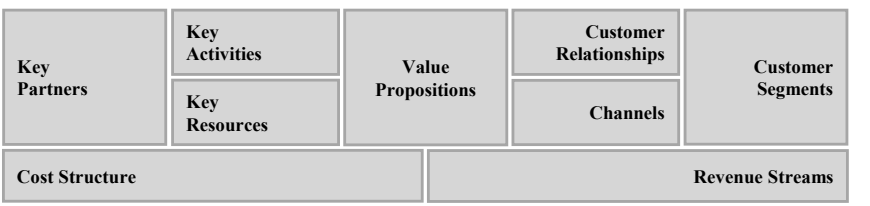

Figure 2: BM Canvas (Osterwalder/Pigneur, 2010)

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/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 offering (*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; *Suarez/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. 2017).

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/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/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. Business Models in Digital Two-Sided Markets

Positive externalities and associated network effects are a key feature of Internet-based BMs (*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.

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

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/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* 2015). 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 (*Andreas* 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.

2. Case 1: auxmoney

In 2007, auxmoney was founded by Raffael Johnen in Düsseldorf (*auxmoney* 2016a). 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* 2015c). 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, b).

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* 2016a). 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 Germanys largest credit comparison portal (*smava* 2016b).

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* 2016b; *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 (*Wirminghaus* 2015a, b). Therefore, Lendico was the first company in Germany to offer private and corporate loans (*Lendico* 2015; *Wirminghaus* 2015b).

5. Cross Case Analysis

To conduct a cross case analysis of smava, auxmoney, and Lendico, we followed the BM Canvas approach of *Osterwalder/Pigneur* (2010) (Figure 2). First, we analyze every BMC for every lending platform separately. We then juxtapose the findings of the three companies in a detailed table (Table 1) 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.

Table 1

Comparison of BMCs of Germanys Lending Platforms

			auxmoney	*smava*	*Lendico*	*Indication of a dominant BM*
Customer Segments	Investors	Private Investors	✓	✓	✓	×
		Institutional Investors	✓	×	×*	
		Partner Banks they are offering/mediating credits	×	✓	×	
	Borrowers	Private Borrowers	✓	✓	✓	
		Companies/Business Borrowers	×	✓	✓	
Customer Relationships	Personal advice	Telephone/Customer Service	✓	✓	✓	✓
	Automated consulting	Investment tools	✓	✓	×	
		Yield calculator	×	×	✓	
		Credit assessment	✓	✓	✓	
		Campaign loans	×	✓	×	
	Self-services	Website	✓	✓	✓	
		FAQs/Help	✓	✓	✓	
		Blog	×	✓	✓	
Channels	Facebook		✓	✓	✓	✓
	Twitter		✓	✓	✓	
	TV advertising		✓	✓	×	
	Digital platform		✓	✓	✓	
	YouTube		✓	×	×	
	Own company blog		×	✓	✓	

(continue next page)

(Table 1 continued)

			auxmoney	*smava*	*Lendico*	*Indication of a dominant BM*
Revenue Streams	Investors	Investment amount	1 %	1.35 %	×	×
		Interest rate and redemption payment	×	×	1 %	
	Borrowers	Loan amount	2.95 %	×	0.25 – 4.5 %	
		Intermediaries fee	×	35 months at 2.5 % 60/84 months at 3 %	×	
Value Propositions	Credit Ranges	Private	1,000 – 25,000 €	1,000 – 50,000 €	1,000 – 30,000 €	×
		Companies	×	×	10,000 – 250,000 €	
		Banks	×	1.000 – 120.000€	×	
	Runtimes		12 – 60 months	36, 60, 84 months	6 – 60 months	
	Investment	Private	< 25 €	< 250 €	< 25 €	
		Companies	×	×	< 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		

			auxmoney	*smava*	*Lendico*	*Indication of a dominant BM*
Key Partners	Investors		Index Ventures	Earlybird	Rocket Internet	✓
			Square Ventures	Neuhaus Partners	Holtzbrinck Ventures	
			Foundation Capital	Banca Sella	Access Industries	
				Econa AG		
				Phenomen Ventures		
	Partner Bank(s)		SWK Bank	Fidor Bank AG	Wire Card AG	
			Biw Bank			
	FinTech for algorithm		Arvato Infoscore GmbH	Infoscore Consumer GmbH	FinTech Systems	
	Auditor(s) for evaluation of creditworthiness	Schufa	✓	✓	✓	
		Creditreform	✓	×	✓	
Key Activities	Platform/network	Operation and development of the digital platform	✓	✓	✓	✓
		Selection of the loan applications	✓	✓	✓	
		Development of an algorithm for the evaluation of creditworthiness	✓	✓	✓	
		Marketing	✓	✓	✓	

(continue next page)

(Table 1 continued)

		auxmoney	*smava*	*Lendico*	*Indication of a dominant BM*
Key Resources	Algorithm for evaluation of creditworthiness	✓	✓	✓	✓
	Digital platform	✓	✓	✓	
	Partnerships	✓	✓	✓	
	Employees	120	80	80	
Cost Structure	Digital platform	✓	✓	✓	✓
	Employees	120	80	80	
	Auditor(s) for evaluation of creditworthiness	✓	✓	✓	
	Marketing	✓	✓	✓	

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

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* 2016c) and, more recently, institutional investors (*auxmoney* 2015c). smava offers their private and business borrowers a credit from private investors and form partner banks (*smava* 2016a; *Hetzer* 2015). Lendico meditates in Germany credits from private investors to private borrowers and companies (*Lendico* 2016a).

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* 2016a; *smava* 2016a; *Lendico* 2016a) and "FAQs" or "Help" sections on their websites (*auxmoney* 2016j; *Lendico* 2016c; *smava* 2016c). 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* 2016g; *smava* 2016j; *Lendico* 2016d).

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* 2016a; *smava* 2016a; *Lendico* 2016a). 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* 2016d; *Lendico* 2016h).

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* 2016b; *smava* 2016f, g; *Lendico* 2016c, d).

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* 2016h; *Lendico* 2016a; *smava* 2016e). Even the returns show further differences between the companies (*auxmoney* 2016f; *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* 2016c) and a supporting tool for the investment procedure at auxmoney and smava (*auxmoney* 2016g; *smava* 2016j).

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* 2016a; *Jaeger* 2016; *smava* 2015; *Huesing* 2011; *Lendico* 2016b). As none of them has a bank license, they need partner banks that are legitimized to offer credit to their customers (*Bertram* 2014; *smava* 2016h; *Lendico* 2016g). In addition to this, all of them need a partner for the development of the algorithm for checking the creditworthiness (*Garno Media* 2015; *Lendico* 2016h) and for credit validation purposes (*smava* 2016i; *auxmoney* 2016d; *Lendico* 2016e).

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* 2016h; *Garno Media* 2015; *auxmoney* 2016d). 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 (*Schneider* 2015; *Schmidt* 2014; *Mauquoi* 2015; *Lendico* 2016b).

Thus, the BMC Cost Structure indicates a dominant BM.

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 3). 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 BMs 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.

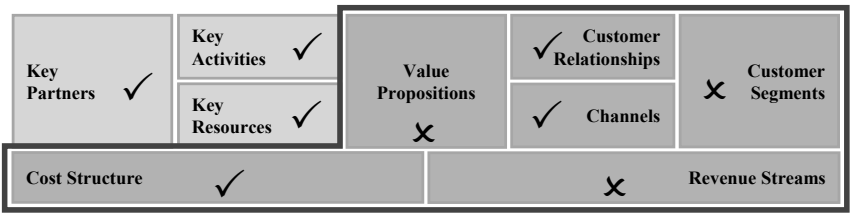

Figure 3: Result of the cross-case analysis of the lending platforms across all BMCs in the BM Canvas in 2016

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 BMs 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* 2021). 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* 2022). 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).

IV. 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.

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.

$$GR_{i,t} = \frac{TA_{i,t} - TA_{i,t-1}}{TA_{i,t-1}} \tag{1}$$

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 4 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 4 GR results are unequivocal. For auxmoney TA

[1] TA data are available until 2020 in the Federal Gazette.

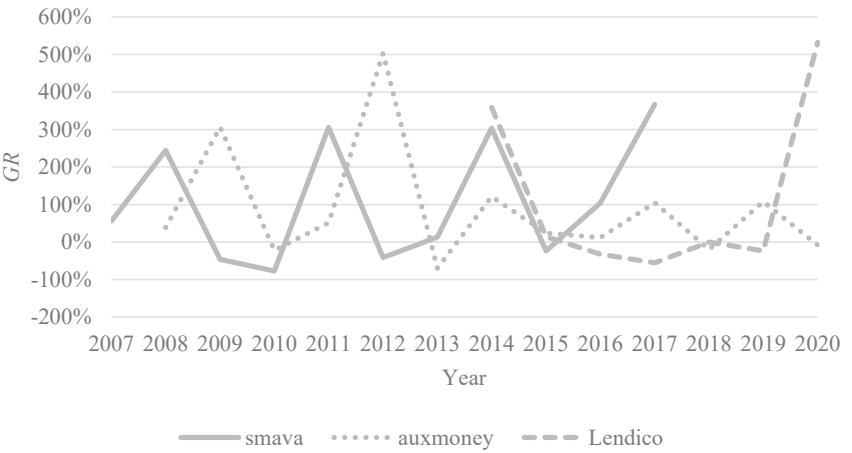

Figure 4: Development of GR (%) of smava, auxmoney, and Lendico

is available between 2007 and 2020 and for Lendico between 2013 and 2020. 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 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.

Table 2 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.

Table 2

Descriptive statistics of GR of smava, auxmoney, and Lendico

	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

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 3. 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.

Table 3

Granger causality tests between GR of smava and auxmoney

H_0: *auxmoney GR does not Granger-cause smava GR*		H_0: *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	
H_0: *Lendico GR does not Granger-cause auxmoney GR*		H_0: *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	

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

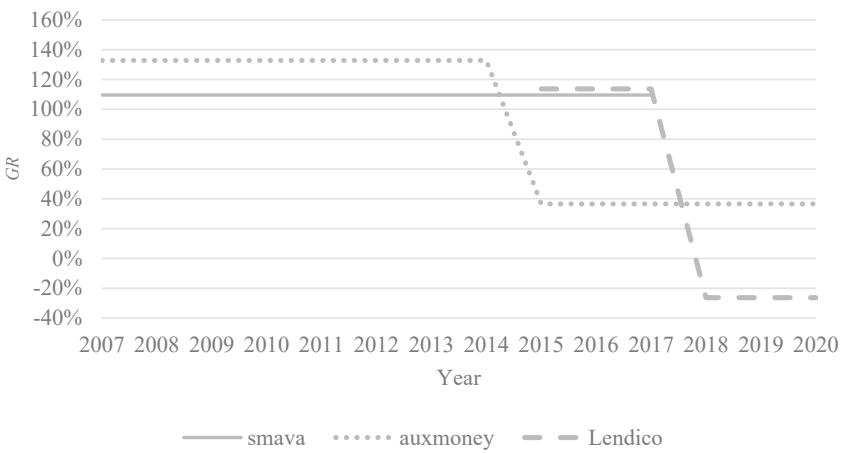

Figure 5: Development of GR (%) means before and after business model changes of smava, auxmoney, and Lendico

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 5. 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.

In order to show whether Figure 5 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:

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

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 $D^{aux}_{changeBM}$ are set to 1 in the case of auxmoney after the business model change and $D^{len}_{changeBM}$ 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/West* (1987) to correct for heteroscedasticity and autocorrelations in the sample's residuals. Table 4 illustrates the results.

Table 4

Business model changes on GR

	Model coeff.° (%) (t Stat.)	
Constant	1.096 (3.031)	***
D^{aux}	0.232 (0.444)	
D^{len}	0.041 (0.050)	
$D^{aux}_{changeBM}$	–0.962 (–2.603)	**
$D^{len}_{changeBM}$	–1.400 (–1.901)	*
Obs.	30	
Adj. R^2	–0.034	

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

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 5. Since D^{aux} and D^{len} are not significant, GR of auxmoney and Lendico do not significantly differ from smava before business model changes. $D^{aux}_{changeBM}$ and $D^{len}_{changeBM}$ 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 R^2. However, the regression results qualitatively confirm Figure 5 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 4 results.

V. 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/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 (*Berger* 2021; *auxmoney* 2014) while smava's BM differed in parts from that of Prosper and Zopa (*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.

VI. 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/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* 1998). 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?

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 6 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 3. Again, a dominant design cannot be observed.

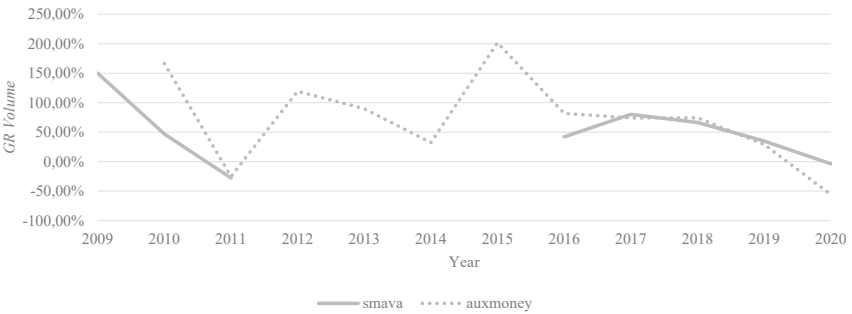

Figure 6: Development of lending volume-based GR (%) of smava and auxmoney

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 5 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.

Table 5

Granger causality tests between volume-based GR of smava and auxmoney

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	

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