An Overview of Online Alternative Finance

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Abstract

Online alternative finance is rapidly growing worldwide while driving financial inclusion thanks to the growing body of data made available by the expansion of cyberspace and the advancement of machine learning and other technology. The epicenter of the growth is China, but online alternative finance is also continuing to grow in developed countries, such as the United States and the United Kingdom, through the creation of new market segments and a shift from some existing financial institutions. The sort of information used for loan screening in the case of online alternative finance is different from that used in the case of finance provided by existing financial institutions. There are even cases where credit history information is not used. Even when credit history information is used, the range of additional data used for loan screening is expanding to include information related to electronic commerce (EC) sites, in the case of corporate borrowers, and detailed information on personality and academic achievement and the history of residential moving, in the case of individual borrowers. This paper provides an overview of the current state of online alternative finance, conducts an empirical and analytical survey on screening methods, and looks at specific cases of online alternative finance.

Keywords: fintech, online finance, big data, AI, loan screening, financial inclusion
JEL Classification: G2, M2

I. Introduction

Fintech is the acronym for financial technology and, in a broad sense, means the use of technology in a financial sector. The development of the Internet in the 21st century has stimulated the electronic commerce (EC) market and electronic settlement, and advanced big data accumulation and artificial intelligence (AI) analysis, and promoted fintech in financial markets.

Then, can we regard financial institutions such as Japanese megabanks as fintech companies? Existing financial institutions such as megabanks, which are regulated and protected by the Banking Law and other laws and regulations (hereinafter referred to as "existing financial institutions"), use technology in a variety of ways, from investment and credit to remittance. However, existing financial institutions are not called fintech companies. In fact, they are facing fierce competition from a group of organizations called fintech companies.

What is the difference between the existing financial institutions and fintech companies?

It is easy to understand that on the one hand, there are financial institutions that use tech-

nology to improve efficiency without changing existing business models, and on the other hand, there are companies that use technology to build new business models and provide value-added financial services to customers who were often outside the scope of existing financial institutions. The latter is regarded as a fintech company.

In this article, the term "fintech in a narrow sense" is defined as "a financial service that optimizes the financial services provided by existing financial institutions in the Internet economy, and improves and reforms them through the power of technology." Unless otherwise specified, "fintech in a narrow sense" is simply referred to as "fintech."

In order to deepen our understanding, I will introduce some typical examples which show the essence of fintech. Social Finance Inc. (SoFi), one of the leading U.S. fintechs and online alternative finance company, delivered a bold message on a TV commercial:

"This is the beginning of a bankless world. Don't bank. SoFi."[1]

Fintech companies, which are now attracting attention around world, are aiming to destroy existing financial institutions. They are criticizing the existing financial institutions, insisting that existing financial companies are being "idle" under the protection of laws and regulations, not adopting new data or state-of-the-art technologies, and not expanding "financial inclusion" (i.e. bringing people who have no bank accounts of existing financial institutions due to low incomes and other reasons, into a financial system).

Successful fintech companies are threatening the survival of existing financial institutions with strong customer support. In addition, fintech companies in the narrow sense have involved people that are not covered by existing financial institutions, such as young people and people in emerging countries. In addition, the youth segments in China and emerging economies, who are now able to access new financial services through increased income and assets thanks to financial inclusion, may significantly grow the global economy in the future. For this reason, fintech is attracting attention in order to capture the future trend of the economy.

On the other hand, existing financial institutions, which are still dominant in the market, are not just looking at such disruptive fintech companies. In 2015, JP Morgan Chase CEO Jamie Dimon expressed his sense of crisis in his letter to shareholders saying, "Silicon Valley is coming" and sought to restructure his financial services through acquisitions and partnerships with fintech companies. On the other hand, criticism has been growing that fintech companies are not well regulated. There are some arguments that online alternative finance is providing shadow banking outside the regulatory framework, and existing financial institutions are facing unfair competition. It has also been pointed out that while consumer protection of deposits is strictly regulated for existing financial institutions, such regulation is insufficient for fintech companies. Inadequacy of money laundering countermeasures and credit quality audits are also pointed out. As regulatory compliance requires a large number of staff and systems development and operation, these regulatory costs for that impose a sig-

[1] https://www.youtube.com/watch?v=KWNsjjjDj_0

nificant financial burden on existing financial institutions. The authorities' future response, including a decision whether such regulations are necessary for fintech companies, is worth attention. As such, existing financial institutions have begun to restructure themselves before they are destroyed, by affecting regulators and public opinion. "Being destroyed or rebuilt?" Existing financial institutions are in the midst of a struggle for survival – a battle of "destruction or reconstruction." In this article, we will consider "online alternative financing," which provides credit services to customers in financial services. Online alternative financing is a mechanism whereby credit transactions between lenders and borrowers can be completed on the Internet through a user interface, such as smartphones, without the direct intermediary of regulated financial institutions.[2]

Section 2 will present an overview of online alternative financing, and Section 3 will use an empirical paper as a clue to the analogy of the future of online alternative finance. In Section 4, we will explore the distinctive online alternative financing methodology. In order to foresee the future amid the shortage of data and papers, we will conduct case analysis of world's leading online alternative financing and in Japan in Section 5.

II. Overview of Online Alternative Finance

II-1. The rise of online alternative finance

The rise of online alternative finance is attributable mainly to technological factors such as the generation of big data due to the growth of the Internet and the advancement of AI technology, and to market factors such as the Lehman's collapse and the economic growth in China where the credit function of private financial institutions is insufficient.

Technological factors have enabled people to build an Internet platform and eliminate existing financial institutions that act as intermediaries with actual stores as points of contact with customers. This reduces the cost of communication. In addition, as big data linked to individuals are accessible, it has also become possible to improve the accuracy of credit screening by analyzing data obtained on the platform through AI. The platform function is expected to eliminate the supply-demand mismatch of funds.

On the other hand, from a market factor, online alternative financing is growing in response to the demand for funds from consumers in emerging economies, such as China, who were outside the framework of existing financial institutions, and individuals and small businesses with high credit risks.

II-2. The history of online alternative finance

Here we want to look back at the history of online alternative finance. Online alternative

[2] There are many cases where an existing financial institution indirectly becomes a partner company in the form of a merger, etc...

financing began in the form of crowd funding. Crowd funding is a fund-raising framework for the publication of music and books, and has a long history. The first attempt which attracted attention and success as an online platform was ArtistShare, which started in the United States in 2003. A musician and programmer successfully financed on a website that seeks donations to digitize his music. Later, a cloud funding platform was rapidly established around the world. Mismatches in the supply and demand of funds have been eliminated on donation-type, investment-type and other types of online platforms.

In 2005, ZOPA, the first consumer peer-to-peer (P2P) lending, was established in the United Kingdom. ZOPA began with a small business of only JPY10 million a month and has grown to over JPY10 billion a month in the next 10 years. In the United States, two companies, Lending Club and Prosper, started in 2006, both of which are now driving the online alternative finance market. In 2010, Funding Circle was established in the United States as a P2P segment for small businesses.

It is also interesting to note that the online alternative financing movement was triggered by IT companies on the West Coast of the United States and by existing British financial institutions. This means that IT companies, which were not a player in the financial market, and British financial institutions, which were losing former strength, challenged the existing financial companies on the East Coast of the United States. Specifically, SoFi, an online alternative finance company that provides balance-type P2P, originated at Stanford University on the West Coast of the United States, and ZOPA, the world's first market-type P2P, was a British company.

The bloom of online alternative financing was triggered by the Lehman's collapse. The sub-prime market shrank suddenly, and existing financial institutions that were damaged in assets were unable to provide sub-prime financing. It was online alternative financing companies including Lending Club, Prosper, SoFi, and ZOPA that moved in on the sub-prime market

Rapid progress of online alternative financing since 2010 has been mainly because i) existing financial institutions were not able to meet the diverse needs of consumers, ii) advancement of technology has enabled to develop new business models from the consumer's point of view, and iii) fintech companies were able to enter the financial market with low-cost through regulatory uncertainty. Online alternative finance companies have expanded the demand outside the scope of existing financial institutions by leveraging state-of-the-art technology, user interface (UI) and user experience (UX) which elicit the needs of new customers.

Growth was driven by a platform-strategy for fintech companies on the Internet. The point of contact of existing financial institutions with consumers was mostly real stores and direct human contact. Because this is a collection of information by personal efforts, the accumulation of information is insufficient and analysis is insufficient. On the other hand, fintech companies can reduce fund-demand mismatches that have not been met in real stores by collecting and analyzing big data through Internet platforms. Moreover, it accelerated its growth by forming partnerships with existing financial institutions for some operations, such

as securitization.

Since 2014, the market has undergone a major shift – the market leader changed from the United States to China. In 2017, China was the largest online alternative finance market in the world. Despite a slight slowdown from three-digit growth, the annual growth rate was 47% in 2017, but the Chinese market expanded rapidly.[3]

China's online alternative financing market in 2017 was USD 358 billion, roughly 100 times larger than USD 3.6 billion in the U.S., although the U.S. continued to grow at 81%, with Europe growing 101% year-on-year and EUR 2 billion.[4] Japan's growth is flat at USD 348 million, which is one-thousandth of China's growth.

In China, there are many credits from state-owned financial institutions (USD 23 trillion asset size as of 2015),[5] and existing financial credit services from the private sector have not been developed sufficiently. For this reason, online alternative financing has, so far, dominated the financial credit market in China.

II-3. Types of online alternative finance

Online alternative finance is broadly divided into three markets: balance-type P2P, market-type P2P, and crowd funding (see Fig. 1).

In balance-type P2P, platform companies use their own funds. They use a balance sheet to equalize the fund settlement, while selling loans to the final lender and matching the lender and borrower. Market-type P2P does not affect the balance sheet of platform providers. In other words, the platform provider does not fill out timing mismatches. In Japan, both types of transactions are subject to the Money Lending Business Act, so providers need to register as a money lender. This is a large burden on them and the both types of P2P have not spread in Japan.

Crowd funding, on the other hand, is a mechanism for soliciting investment and cooperation from a large number of unspecified parties in order to meet the needs of borrowers with certain objectives. Crowd funding can be divided into three types: investment type, donation type, and loan type. Since the loan type is not under the regulation of the Banking Law, it can be easily implemented, and it is essentially a P2P lending in Japan. Subjects who receive the services can be divided into consumers, businesses, and real estate.

The largest segment of online alternative financing in the world was market-type P2P (consumers) as of 2017, with 63% in China, 23% in Asia-Pacific excluding China, and 34% in Europe.[6] Balance-type P2P (consumers) has also grown rapidly over the past few years. By combining with securitization, players can aim for new profit opportunities.

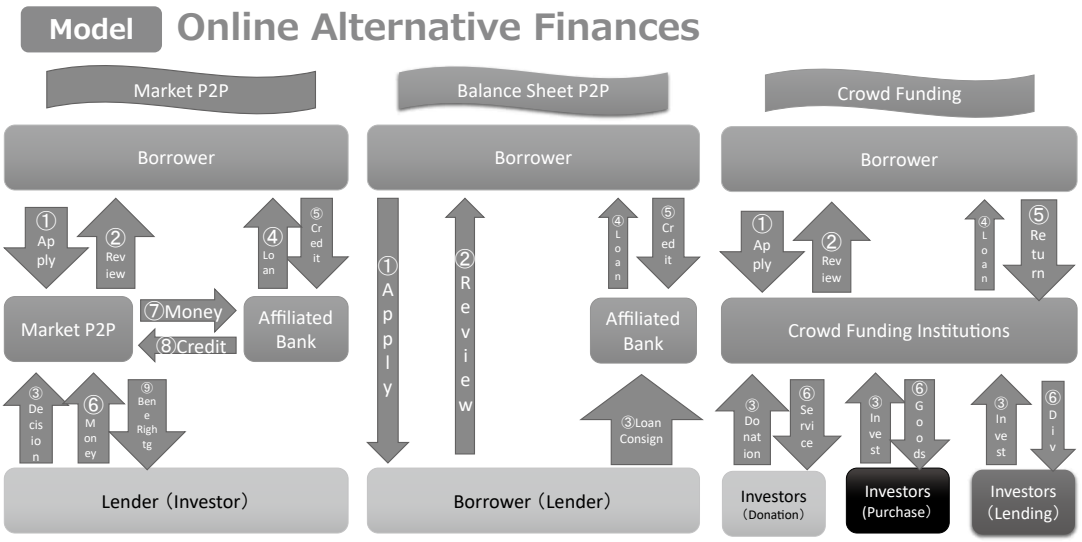
Market-type and balance-type P2P (businesses) are also growing rapidly, and loans to

[3] Cambridge Center for Alternative Finance, "The 3rd Asia Pacific Region Alternative Finance Industry Report," Cambridge Press, 2018

[4] Cambridge Center for Alternative Finance, "The 3rd EUROPEAN ALTERNATIVE FINANCE INDUSTRY REPORT," Cambridge Press, 2018

[5] Haky Moon, "Global Banking Industry Outlook," Bank of China, 2016.

Fig. 1



small businesses are particularly promising. Large companies have traditionally used direct finance relatively easily and have a variety of procurement options. On the contrary, small businesses have mainly used indirect financing from banks and other sources, and they are screened based on the collateral and guarantees of representatives and past financial results. As a result, loans have been provided primarily to profitable companies. Unprofitable companies and companies with a short history such as ventures had faced large financing problems. In market-type and balance-type P2P (business) segments, it is made possible to resolve information asymmetry and finance such small businesses that existing financial institutions cannot do, by using EC sites and additional information on cloud-based accounting companies used by the businesses. Financing using an electronic loan information record for the entire supply chain in the industry has also recently become more active.

[6] Cambridge Center for Alternative Finance (2017), "The Americas Alternative Finance Benchmarking Report," Breaking New Ground, Cambridge Press

Cambridge Center for Alternative Finance (2018), "The 3rd Asia Pacific Region Alternative Finance Industry Report," Cambridge Press

Cambridge Center for Alternative Finance (2018), "THE 3rd EUROPEAN ALTERNATIVE FINANCE INDUSTRY REPORT," Cambridge Press

III. Future of Online and Alternative Finance

Regarding the future progress of online alternative financing, there are, though limited, empirical articles which compare credit by existing financial institutions and online alternative financing, and case studies. These analyses show that five perspectives define the future of online alternative financing.

III-1. Replacement from existing financial institutions

C. Roure, L. Pelizon, and A. Thakor (2018) developed a theoretical model from the viewpoint of whether existing financial institutions and online alternative financing providers are competing with each other, and conducted empirical analyses using data in Germany. The result is that existing financial institutions would be replaced by online alternative financing providers if the regulatory costs (capital reserve ratio) remain high and the spread of risk among financial institutions expands.

Similarly, Tang (2018), based on empirical research using data in the United States, showed that a shift from existing financial institutions' loans to online alternative financing would progress in the event of a negative disruption in bank credit availability.

Although not explicitly stated in these articles, the replacement to online alternative financing will inevitably be affected by the entrepreneurial ecosystems in each country's IT sector and the financial regulations by authorities. With regard to the latter, it is also important whether new financial business permits can be easily obtained and to what extent existing financial institutions are protected.

Differences in each country's online alternative financing regulations ("regulatory arbitrage"), also play an important role in determining differences in growth in each country. Since 2005, the United States was the first country to tighten its regulations. At the time of April 2008, Prosper and Lending Club considered themselves financial intermediaries, but the U.S. regulator SEC regarded them as securities companies and both companies were subject to regulation. They suspended operations for the time being and were forced to review their systems, resulting in the halt of their rapid growth.

On the other hand, as the United Kingdom had purposely excluded online alternative financing providers from being subject to regulations ("sand boxed") until 2014, ZOPA and other online alternative financing companies were able to make rapid growth.

Canada has state-specific regulations. In 2008, IOU Central in Quebec entered the online alternative financing market, but only 20 days later, Quebec regulators tightened their regulations. They regarded IOU as a securities company and requested submission of prospectus on each loan. IOU failed to comply with the tightening of the regulations and became bankrupt. On the other hand, Community Lend, which started in Canada at the same time, conducted operations amicably with regulators, but with high regulatory costs, its cash position deteriorated and left the market in 2012. As a result, Canada lags far behind other countries in this area.

Thus, it is important that differences in regulations across countries have a significant impact on the growth of online alternative finance providers through regulatory costs. Online alternative financing would expand in less regulated countries, if other conditions were same.

Regulations on money laundering and investor protection have been strengthened for existing financial institutions and online alternative financing companies. However, since the response to regulations is relatively underdeveloped in online and alternative financing, it is highly likely that the growth of these regulations will be slowed down through the increase in costs.

III-2. New credit-financial inclusion

As mentioned above, online alternative financing has resolved the demand of consumers and small businesses that were not covered by existing financial institutions, and this trend will continue in the future.

Schweitzer and Barkey (2017) provided data on the use of alternative financing by small businesses that are unable to raise funds from existing financial institutions, though it should be noted that data is mainly from survey results and it was a comparison without information on differences in the examination methods and data utilization.

Jagitiani, Lemieux (2017) analyzed mainly Lending Club's data and examined how credit in various parts of the United States would differ from where the activity of existing financial institutions was active and where it was not. The results show a rapid increase in the share of the online alternative financing market in areas where the competition of existing financial institutions is low or where the number of bank branches is decreasing.

Emerging economies have seen rapid progress in online alternative financing as financial services have been insufficient. There are more than 5,000 online alternative finance platforms in China. The first online alternative financing in China appeared in 2007, only two years after the foundation of ZOPA. The rapid progress has been made because the credit creation mechanism in China was weak and there was foundation for easily accepting new financing; and the related laws and regulations are inadequate and new ventures can easily enter the business.

Furthermore, the Chinese government initially supported the development of the P2P lending market as a solution to the insufficiency of credit creation in China. During the emerging period, platforms were often operated by state-owned companies. As the platforms operated by state-owned enterprises are highly reliable, they are financing more than private platforms and the probability of bankruptcy is stable at a low level. This can be considered as an implicit guarantee mechanism by the state. As a result, the state-owned platforms are financing with relatively low interest rates.

Meanwhile, J. Jiang (2018) reported that around 60% of over 5,000 platforms have already been closed. In addition, according to data.01caijing.com, 218 platforms were closed from January 2013 to April 2016 and 26% of platforms are at risk of survival. In fact, many

P2P platforms collapsed in 2018, and the suicide of lenders on the platform became a major social issue. While the possibility of a burst in China's bubble economy cannot be denied, the Chinese authorities are tightening restrictions on online alternative financing, and this is a pessimistic factor in China's future online and alternative financing market.

In China, the history of credit creation by the private sector is short, and there is very little past credit history, which is one of the most important pieces of information on financing mainly to individuals in developed countries. According to the PBC Credit Reference Centre,[7] only less than 40% of online alternative financing credit in 2014 had a credit history. The fact that many loans are provided to people who have never received credit raises questions the soundness of credit.

In China, on the other hand, due to the high risk of borrowers' bankruptcy and the platformers' risk in balance-type P2P, many insurance companies provide principal guarantees as part of their self-help efforts. It is interesting to compare with other countries, where it is basically lenders' own responsibility.

Regarding regulations related to the risk of bankruptcy, the People's Bank of China (PBOC) issued guidelines in 2014 which the P2P platformers should observe, and in 2015, the China Banking Regulatory Commission became the official regulatory authority of the P2P platform. In 2016, the National Internet Finance Association (NIFA), a voluntary regulatory body, was established.

III-3. Reduction in credit risk due to big data and technological advancement

Recently, machine learning such as big data and deep learning, and natural language processing that enables text data analysis, are expanding rapidly with AI technology advancement. These technologies allow us to calculate credit risk more precisely, and there is a possibility that borrowers whose credit risk is lower than that of existing financial institutions will be able to lend at lower interest rates.

Emekter, Jirasakuldech and Lu (2014) used information on interest rates for small businesses set by Lending Club, a major online alternative financial company, FICO score information and the borrower's debt ratio, to analyze each borrower's risk profile. As a result, compared with existing financial institutions, online alternative financial companies offer credit at a more appropriate rate, which is closely matched to the borrower's risk characteristics.

Though the Zhima (Sesame) Credit by Ant Finance is well-known, in Japan too, Mizuho Bank and Softbank has jointly developed J-Score and Line decided to start a consumer scoring business. It is important to note that these services enable more accurate assessment of the credit risk of borrowers and lower credit prices, which contributes to the expansion of online alternative financing.

Differences in the examination methods are discussed in the next section. In online al-

[7] http://www.pbccrc.org.cn/crc/gywm/index_list_list.shtml

ternative financing, the asymmetry of information between existing financial institutions and customers can be supplemented with big data on the Internet and reduced to more accurately measure risk and optimize earnings per risk. For example, small businesses and young people with short credit histories have not been able to raise funds from existing financial institutions. In order to complement this asymmetry of information, big data such as information on small businesses' EC sites, trends in payments for mobile phone use by young people, and their influence on SNS will be analyzed, and it is also possible to estimate the risk of borrowers. It should also be remembered that EC sites, SNS providers and IT infrastructure companies which have information to fill this asymmetry are eager to become players in the online alternative finance market.

On the other hand, the question of how far the personal information given to an individual without careful consideration should be used and how far the risk of such scores walking alone and the "right to be forgotten" should be protected will also be an important issue. In Europe, the General Data Protection Regulation (GDPR), a new mechanism for protecting personal information, was put into effect in 2018, requesting online alternative financial companies to observe the regulation.

It is also unknown how reliable the data used is, and how the credit risk calculated with wrong information affects the economy, financial markets, and online alternative financial companies. So, care should be taken in the future.

III-4. Credit cycle

In the case of online alternative financing in developed countries, credit risk has remained low at around 1-3% according to the websites of major online alternative finance companies as of January 2019. However, credit cycles since 2013, when online alternative financing began to grow at a high level, have been steady. When the cycle goes into a downward trend, the risk of higher loan losses and the risk of a steep increase in bankruptcy should be kept in mind. It is necessary to take into account the possibility that, even if funding costs are currently low, the cost will increase depending on the credit cycle, and to have strict views on how much reserves can be accumulated by then.

III-5. A need to support social infrastructure

Online alternative financial companies provide services to the segments in which existing financial institutions earn most, through using technology that IT companies have developed from the user's perspective (UX/UI) to optimize the experience value of their customers, without having to deal with inefficient areas imposed on existing financial institutions as a social mission. It is necessary to discuss whether unbundling such profitable segments of existing financial institutions and generating profits without taking on a social mission is appropriate or not.

IV. Analyzing differences between existing financing and online alternative financing screening methods

In this section, we analyze the method of screening online alternative financing in comparison with that of existing financial institutions.

The biggest problem with loan decisions is the "asymmetry of information" between lenders and borrowers. In online alternative financing, unlike loans from existing financial institutions that can identify borrowers, loans are made between anonymous individuals in most cases. The link between anonymous lending is information on social relationships such as SNS, and the relationship between information on the characteristics of borrowers and the process of lender's loan decisions is the focus of attention.

IV-1. For consumers

Existing financial institutions have traditionally estimated the future repayment potential of borrowers based on credit history, debt status, and annual income. For example, in the United States, a credit score provider and forecast analysis company FICO[8] scores the repayment history of individual borrowers. In the score calculation (as of the end of 2018), the final score is calculated by adding outstanding debts (30%), repayment history (35%), other credit balance (10%), borrowers' history (15%) and others (10%) to other factors. The score is used to determine whether prime rate borrowing is possible. In Japan, there are no companies like FICO, but loan judgement is done based on information from the Personal Credit Information Center (Kojin Shinyou Center: KSC), a credit information agency that collects and manages information on bank card loans and mortgage loans, Japan Credit Information Reference Center Corp (JICC), which manages credit information such as consumer financial companies, credit companies, credit card companies, and guarantee companies, Credit Information Center (CIC), which manages credit information on consumer finance companies, credit card companies, and leasing companies, and each bank's individual factors such as the size of the company which borrowers belong to and the number of consecutive years of service.

Jagitiani, Lemieux (2017) showed that the correlation between the consumer credit risk rating and FICO score defined by Lending Club exceeded 80 percent at the time of their establishment in 2007, but has later fallen to under 40 percent. It is assumed that, by using the FICO score as the preliminary information for machine learning and then incorporating the big data that Lending Club has independently acquired as new information, the ex-post information continues to be rewritten and the credit model is evolving.

In online alternative financing, most of the loans are made anonymously. Big data of individuals on SNS, which has been rapidly accumulated with the expansion of the Internet economy, is analyzed using tools such as AI to utilize in online alternative financing. For ex-

[8] https://www.fico.com/en, https://www.fico.com/jp/about-us

ample, Prosper, an industry major company in the United States, establishes a group among members and the person responsible for overseeing the group decides credit accommodation, on the condition that the borrower's borrowing history is disclosed, albeit anonymously. Then, an auction-based system for recruiting lenders within the group and a system for mutual monitoring within the group have been established. Interest rates are fixed, uncollateralized, and the loan amount is from USD 1,000 to USD 25,000 in installments over a period of three years. Both the borrower and the lender can freely post any desired loan information on Prosper. If the borrower's desired amount is reached during the initial auction period (three to ten days), the loan will be made. One can also set up a group, become a leader, create information pages regarding the group, and invite new members on condition that s/he is not a borrower within Prosper. It is also possible to determine the details of credit information to be used when borrowing and lending within the group. Prosper discloses information on the extent to which each group has made or failed loans. All members of the group can invite friends to the group and receive USD 25 when invited and a USD 50 reward when the loan is successful.

S. Freedman, G. Jin (2017) analyzed whether information asymmetry could be resolved and loans made by making the exchange of information in Prosper itself credit risk screening information. They concluded that although information is valuable on social networks, they cannot believe everything because of the credibility of the information itself and the asymmetry of information cannot be resolved. On the other hand, they also concluded that the existence of evaluation data on friends within the group, the size of the group (the lower the number of people who borrow the small amount, the higher the probability of a loan being made), and the past probability of bankruptcy within the group affect the "establishment" of the loan. The empirical results also show that, contrary to our intuition, the probability of bankruptcy increases as social relationships between groups deepen (except when a friend evaluates a borrower and becomes a lender himself or herself). This means that the social network is insufficient for the probability of bankruptcy of the loan, though information on the social network is used for loan granting.

The empirical results suggest that online alternative financing platforms such as Prosper may be a key strategic decision-making issue: whether they focus on short-term financing or on reducing the probability of long-term bankruptcy.

D. Pope and J. Sydner (2011) also use photographic information from Prosper individuals to show that the appearance of the borrower plays a major role in finalizing the loan.

R. Ge, B. Gu, J. Feng (2017) analyzed data from China's largest P2P lender PPDAI (founded in 2007; JPY 17.3 billion and 600,000 members as of the end of 2013). An empirical analysis based on the borrowing balance, term and purpose, personal information such as gender, housing and education which members disclose to the platform lenders, and SinaMicrobrog's data (information on 35,457 loans (11,047 borrowers) from 2011 to 2013 and bankruptcy) showed that the following is true.

■ Borrowers disclosing social media accounts have a low probability of bankruptcy

■ Detailed information on social media is related to the probability of bankruptcy

(1) Borrowers with a high degree of social media relationships have a low probability of bankruptcy

(2) Borrowers engaged in social media are likely to have a low probability of bankruptcy

F. Thies, J. Rudolph, A. Benlian (2016) analyzed data from KickStarter, a major cloud funding company in the United States from January 18, 2015 to August 6, 2015. Text and video data of a projects of 33,420 campaigns with a description of more than 100 characters from 3,580,579 supporters, and USD 324 mil total funding from a total of 47,526 loans, were converted into text data using the Google Web Speech Application Programming Interface (API). Then, the text data was used to estimate the Big 5 personality dimensions by IBM's Personality Insights. The results show that the following is true:

■ The personal character of the crowdfunding borrower influences the outcome of the campaign (probability of loan success)

■ The personal character of the crowdfunding borrower influences the spread of information in social media

IV-2. For businesses (small businesses)

Loans to small businesses by existing financial institutions mainly consist of personal guarantees by executives who have the authority of representation, and real estate collateral held by companies. On the other hand, online alternative financing is not limited to the collateral and guarantee principle of existing screening methods, but can be financed from a wide range of people through the market by providing stories of the company's business and disclosing it via videos on the Internet and other media. As a result, it has become possible to raise funds from the attractiveness of the business itself, even if companies without initial collateral, such as a venture company, or even if the executives are young and the value of the guarantee is low, thereby contributing greatly to economic growth. Lending will also be made possible on the basis of information on EC websites and e-commerce information. The largest social lending company in Japan is Maneo, with a cumulative contract value of JPY 154.1 billion as of December 2018.

For example, Tranzax in Japan offers a service that improves economic efficiency by lowering interest payments across the entire supply chain, rather than individual enterprise rates, based on electronic loan information records across the entire supply chain. As a result, it is possible to use this service as part of financial support for subcontractors from the parent company, thereby providing financial support and lowering the burden of interest rates on subcontractors. In addition, Free, a cloud-based accounting support company for small businesses, has established a system in which real-time accounting information of small businesses are used to provide short-term (at least the next day) loans in cooperation with Japan Net Bank. Centering on this type of accounting support company, the integration of information owned by multiple financial institutions for each company using API is gradually proceeding.

However, connecting the customer information possessed by banks and credit card companies with API works both ways in the era where data is of most value, and financial institutions will be forced to make tough strategic decisions. If information is increasingly linked through API around the world, online alternative financing for small businesses will grow rapidly in Japan as well.

IV-3. For real estate

Except for very large projects, real estate investment by existing financial institutions has been based on land collateral. Online alternative financing provides a market platform for future cash flows from land.

V. Online Alternative Finance Case Study

[United States] Social Finance, Inc. (SoFi) (founded in 2011)

SoFi was founded as a lending company specializing in student loan buyback, focusing on a new market segment called High Earnings Not Rich Yet Individual (HENRY).While in the Stanford Graduate School of Business, Mike Cagney thought that credit risks in the prime market were not appropriately assessed, and based on this unique analysis, he founded SoFi with some other graduate school students in 2011. In just six years through 2017, SoFi provided more than USD 15 billion loans, reaching one of the largest financial institutions in the student loan market. This is also a company in which Nickesh Arrora, who was once one of the candidates for SoftBank CEO Masayoshi Son, invested USD 1 billion for the first time after joining Softbank.

Traditionally, the buyback market for student loans has been viewed as a very risky market with a high delinquency rate and a high probability of bankruptcy. On the other hand, the market itself was expected to grow rapidly in 2011, as the rate of enrollment in U.S. universities remained high despite the continuing surge of tuition fees. Unlike Japan, 96% of university students in the United States used student loans (as of 2009) and their bankruptcy rate increased year by year, with over 5% in 2003 and over 10% in 2016.

SoFi noted that student loan rates were the same when comparing business school graduates from Harvard and Stanford with average business schools. Based on the analysis by Cagney, unlike the existing student loan companies, SoFi automatically aggregated the details of the university in which the student is (or was) enrolled, the details of his or her place of employment, and the various payments made on a daily basis for each student. Based on this information, the company constructed an automated examination model to calculate monthly cash flow tables using AI and provided loans. By developing a social finance scheme with a Stanford Graduate School of Business alumni as a lender and a graduate school student as a borrower, the project began with limited risks and gradually expanded its scale.

In addition, SoFi has also adopted a novel approach; it has made a community (for ex-

ample, employment mediation or partner matching community) comprised of people who once participated in the SoFi network as a lender or a borrower, and their information relating to the community is also used for screening information. SoFi also extended the model to provide real estate loans and consumer loans to people in the community to match their life events. While SoFi is active in the securitization of assets in cooperation with various financial institutions and secures a revenue source, it has grown by strengthening its functions as a platform for lenders and borrowers. It has been reported that, in the future, SoFi is considering offering robo advisory services (i.e. investment management by AI) and insurance services to the HENRY market.

[China] Ant Financial (founded in 2014)

Ant Financial is a financial company under the Alibaba Group, which boasts one of the world's largest B2B-EC. Alipay was started in 2004 as a means of payment for B2B-EC, and due to the financial regulations of the Chinese authorities following Alibaba's listing on the NYSE, Alibaba took over Alipay and Ant Financial was established in 2014. Ant Financial has developed and operates Zhima (Sesame) Credit, a credit score for individuals. It is a giant in the fintech industry, with the aggregate market value of JPY 8 trillion or more. In the second quarter of 2016, its EC volume was USD 126 billion, accounting for 96.5% of the Chinese C2C market, which is responsible for Alipay transactions in the market. Based on the vast amount of information on Alipay and transactions, Sesame Credit developed by the company was officially accredited by PBOC as an individual credit score in 2015, and the credit score of 350 to 950 points is calculated for each of the following five factors.

- Payment history of credit cards
- Preferences through online activities and transactions
- Information about an individual's assets: social and life insurance, assets such as cars and houses, asset balances on Alipay, and cash flow information;
- Detailed personal information: address, moving history, mobile phone number, education and employment history, and criminal history. In addition, information can be refilled and scored in conjunction with SNS such as LinkedIn.
- Social Relationships: enormous information about people involved, such as relationships, close friends' wealth, and working companies.

In addition to the vast amount of information the company has, it also uses personal information held by the Chinese government, such as the criminal history, education, and employment history of each individual for scoring. This is difficult to imagine in other developed countries. By improving the quality of credit information, the company can also accurately calculate the risk of offering credits that use Alipay and recommend products that suit each individual's taste.

On the other hand, Sesame Credit system goes beyond the scope of the company to assess the creditworthiness of individuals throughout China. For example, if one earns a Sesame Credit score of above 750 points (less than 5% of all), many P2P platforms can lend

funds at special rates, s/he can easily obtain Singaporean visas, and get special services in hotels and restaurants.

As a result, the company, with its current Sesame Credit data, can calculate in detail what behavior and preferences the majority of people in China are doing or having, what changes are taking place, what kind of financial services they want, and how much the risk of repayment is at hand.

[China] 007fenqi (founded in 2015)

007fenqi is a start-up that combines small loans for university students in China with its own e-commerce platform. Now, 007fenqi is known as one of the five-largest companies in the segment of small loans for university students. Many Chinese college students are from rural areas and do not have past credit history nor assets with collateral value. So, they were considered "financially vulnerable" and existing financial institutions did not provide loans to the segment. On the other hand, the appetite for consumption in China has spread to university students, and the demand for funds aimed at purchasing products was very high.

Against this backdrop, the company launched an e-commerce site for university students and built a model for micro-credit up to USD 450 for the purchase of products from the e-commerce site. The screening is conducted on the same day and payments may be made by the borrower within one year. As there is no credit history, the company uses credit information on student mobile phone payments, university name information, facial photographs, residential information, endorsement from friends already using the company's loan, as well as Sesame Credit scoring information provided by Alibaba, as well as micro-credit default information such as Tongdun, Shanghai Credit, or Allwin Credit. According to the company, it conducts loan screening from more than 500 information points.

The site also provides part time job information for students and reduces the risk of payment through a mechanism that can be offset against the payment. It is also interesting to note that, after graduation, the borrower can be a lender and provide loans to university students through the company's platform; the company has developed a mechanism to strengthen its own platforms. In other words, they are building an ecosystem for young people's finance, starting with university students.

The company has acquired 300,000 university students in a short period of time, and more than 200 students are new users every day.

[Japan] J. Score[9] (founded in 2016)

It was established as a joint venture (50% each) of Mizuho Bank and Softbank. In addition to funds, staff are dispatched from both companies by 50%. The company has started AI score lending (online lending for individuals) in September 2017, and the contract amount has been steadily increasing. Under the Money Lending Business Act, customers' big data are acquired independently in addition to general credit information. Machine learning is

[9] Based on the interview with J.Score Executive Officer Takashi Tejima (title at the time of the interview)

used to score their creditworthiness and future potential as AI scores, and loan amounts and interest rates fluctuate between 0.8% and 12% depending on the score. In addition to personal credit information, AI scores are calculated by taking into account lifestyle-related issues such as hobbies and possessions, personality tests, TOEIC, and school grades. By linking it to information from Softbank, Yahoo, and Mizuho Bank, the bank has created an advantageous lending mechanism through an increase in AI scores. From the perspective of financial inclusion, as with SoFi, the focus is on high-income and academic people in their twenties and thirties who have not previously borrowed in consumer finance. As stated in its founding philosophy, "Let's eliminate the negative image of borrowing and invest in yourself," children's educational funds and their own study investments account for 40-50% of the funds used. With a per capita borrowing of around JPY 1 million and an average annual income of JPY 5 million, the company has successfully constructed a unique segment (less than JPY 500,000 and less than JPY 4,000,000) compared with Japan's average consumer loans.

As more personal information is secured through AI score calculations, partner companies provide rewards tailored to each individual's score. At the present point in time, the partner company is free of participation, but if the environment is established in the future, it is looking at the possibility of becoming a fee-based business, suggesting its potential as an information bank. There are many new attempts in Japan, including efforts to change user lifestyles.

VI. Conclusion

The advancement of online alternative finance has been accelerated by the advancement of technology, such as the development of big data based on the Internet and the sophistication of AI analysis. In particular, the rapid expansion of the Chinese market over the past few years is remarkable. As empirical studies have shown, although the pace of growth depends on external factors, complementation and substitution of existing financial substitution functions will continue. On the other hand, the screening method for online alternative financing has not yet demonstrated its superiority in all credit cycles, and the financial base of the venture companies involved is weak, and it may become a risk factor in the future financial markets. With its fast-growing and bankrupt platform, the Chinese market is so large that it can have a major impact on the global economy, which attention needs to be paid to. In addition, the extent to which restrictions on investor protection and money laundering are imposed on online alternative financing and how financial infrastructure should be developed will be discussed in the future.

The online alternative financing market is rapidly changing and growing, but it is still in its infancy and has limited market data, and there are many uncertainties about the usefulness of the screening process, the impact of regulations, and how it will compete with existing financial institutions. However, it is certain that online alternative financing will have a major impact on the economy and financial markets in the future. Since there is no compre-

hensive article on the online alternative financing market in Japan, it is hoped that this article will provide a better understanding of the future by providing an overview of the current market and analytical results, and that it will encourage the sound development of the Japanese online alternative financing market, which is lagging behind global markets.

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