Fintech, Regulatory Police and Risk

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Abstract: The global market witnessed the prosperity of Fin Tech, especially peer-to-peer lending. However, with severe regulation and the recent pandemic, we cannot find the glory of it used to be. We demonstrated an empirical model to figure out what are the possible key elements which can make peer-to-peer lending a more health commercial mode. And the data shows that a shrunk market tend to be good sign of its development.

1. Introduction

The last decade saw a soaring growth of scale of FinTech lending market in a worldwide extent. With current technology, for instance, Big Data, Machine Learning, and Data Mining, it has been a great alternative financial method for consumers and small business. Although it used to be prevalent in both China and U.S. which holds the top 2 market volume in globe, people, no matter the organisers, lenders or the borrowers, nowadays are disappointed at a great amount of business models of FinTech lending. In China, only Ant Credit Pay and other capable companies in Internet industries last eventually, while the others, especially those who aimed at peer-to-peer lending, was exposed to sorts of negative news, like violent debt urging, bad debt issues, and capital chain rupture, and vanished at last under severe regulation by government. It is nearly the same in U.S. for local investors were reported that they suffered from the failure of peer-to-peer lending. The retail investors witnessed a typical example, the closing down of so called "promising" peer-to-peer" platform, Lending Club. Somehow, peer-to-peer lending has become a symbol of scam, and everyone holds an extremely cautious attitude towards this kind of FinTech lending. However, if the initial scam-oriented companies are eliminated, the difference between giant companies and other small size ones is weather capable to handle the shock of risks.

2. Fintech Lending Definition

We define FinTech lending as the use of technology to provide lending products. The use of technology has two main flavours: first, to improve the customer-lender interaction (for example, with a fully online application process), giving rise to a better user experience, faster processing times and lower operational costs. Second, technology can be used to improve screening or monitoring, for example, by using alternative data sources or machine learning methods.

Bank for International Settlements (2018) states that FinTech refers to the use of technology to provide financial services. FinTech lending is defined as the use of technology to deliver loan services by Berg et al (2021). And he reckons that FinTech lending can be divided into

corresponding two aspect: the customer-lender interaction and screening and monitoring borrowers. Zhang (2021) defines Fintech Lending an innovation of financial loan, dedicated to the nature of modern lending: innovation in technology, functions, procedures, service product, mechanisms, etc.

## 2.1 How Does It Work as Alternative Substitution of Classical Bank Lending?

Lending, in traditional bank industry, is designed in a standard process. Although the quantitative criteria may vary subtly. The basis of criteria among different banks are almost the same due to the cautiousness to bad debt. So, it is rather obvious that classical bank lending needs risk premium of not only interest but other capital as compensation of exposure to bad debt risk. As a result, pledge is mandatory during the whole lending procedure. Financial institutions need to occupy the right to use of certain equivalent asset of borrowers, even occupy the ownership in some extreme circumstances, to prevent them from bad debts, which impede many potential customers to receive loan to establish their early business, in particular, for those promising small and middle size corporation or the youth who need to start their own career. Nevertheless, in the direct aftermath of credit crisis, traditional institutions become so cautious that they would rather abandon these customers and the lending market behind them, because they fail to identify the ability to repay the debt by using their classical method with direct data as indicators.

Thus, FinTech lending, aiming to fill and occupy the blue ocean market, has developed an explosive lending market share since financial crisis in 2008. It is reported that China and the US take over 95% of the FinTech lending market. Data by Jagtiani et al. (2021) shows that the market share of FinTech lending reached a proportion of approximately 14% in 2020 in U.S. mortgage market. But IBIS world (2021) provided evidence showing that there was a decline since 2019 and it predicts that the trend will continue with a -3.4% growth rate. Meanwhile, the classical mortgage has been stable during recent years, staying at the level of 15 trillion dollars approximately.
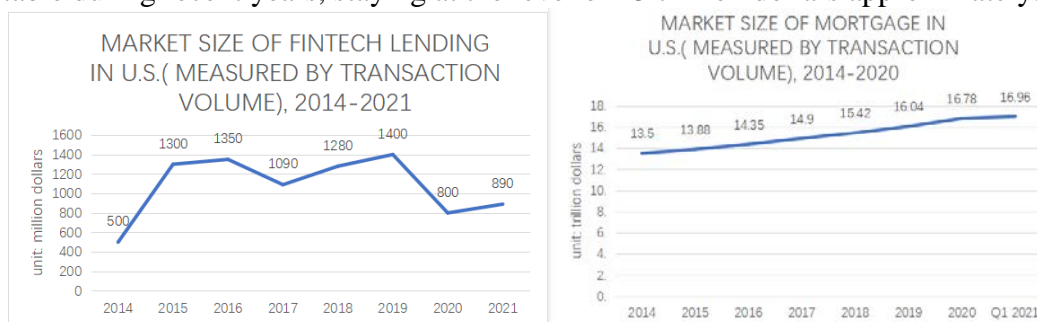
Fig.1 The Growth Trend of Mortgage Market in U.S. and China

China, the largest market in globe, saw a soaring growth since 2014, at the point of 245.32 billion yuan and then a recession from 2804.8 billion yuan is observed after year 2017.
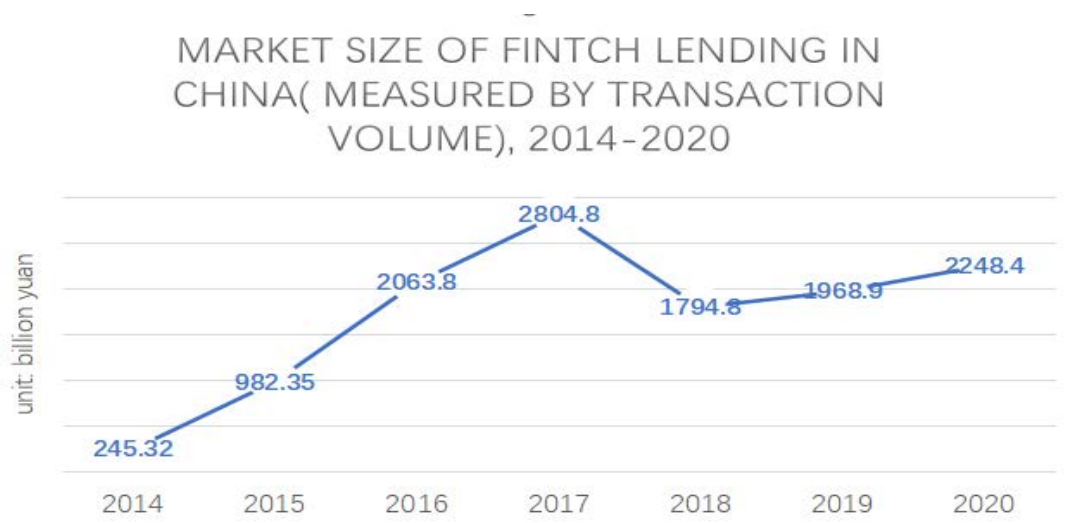
Fig.2 The Growth Trend of Fintech Lending in China

The China Banking and Insurance Regulatory Commission issued a statement at the end of December last year, warning of the risks of excessive borrowing by online lending institutions and the social problems caused by debt collection.

As can be seen in the date shown above, FinTech lending sector now shrink comparing to the market scale before. The rate of growth is slow currently, due to regulation and cautious attitude because of scam scandals. But there is no doubt that the market size of FinTech lending is much larger than it in 2014 even with more and more restriction. It implies that we might enjoy a more improved market due to both of the two factors. While the market size is rather considerable, it still cannot be compared to the bank mortgage market size. The emergence of Marketplace lending has prompted many pundits to call attention to the possibility for traditional banking to be disrupted by such innovative business models. Analysis by Deloitte suggests otherwise, concluding that marketplace lending lacks the competitive edge required to pose a challenge to the traditional banking model in the global market. While they may not completely disrupt the business, we anticipate them to remain a part of the ever-changing financial market. FinTech lending should be viewed as complements to the core model rather than rivals, and banks should stay still or look for ways to collaborate to improve their total client offerings. They are two different types of logic: one is judging the ability to repay the debt by pledge and standardization and the other one is working as the complement of bank mortgage at the very beginning.

3. The Bad Debt Risk and Regulation

Current literature categorised the bad det risk of FinTech lending into three factors:1. Risk from the platform itself 2. Risk limited by technology 3. Risk affected by regulation.

3.1 Risk from the Platform Itself

PEER-TO-PEER platforms, according to Liu Y et al. (2020), are mostly used by long-tail clients with capital needs as a complement to traditional lending models. Due to the difficulties in confirming their identities and the accuracy of information, online lending platforms are to blame for an increase in credit risk, resulting in financial hazards. The PEER-TO-PEER online lending platform lacks bank-level asset and liability management, and the source of funds cannot be adequately matched with the asset side, and there is a margin shortage. As a result, the liquidity

risks associated with PEER-TO-PEER online lending services are higher. Yan et al. (2019) investigated the danger warning of PEER-TO-PEER platforms using machine learning approaches. The danger of runaway has escalated as a result of investor fear prompted by the PEER-TO-PEER crash. When the platform's liquidity risk rises to a point where it can no longer afford it, events like platform collapse and bankruptcy occur (Freedman 2017).

3.2 Risk Limited by Technology

Nowadays, with development of Big Data, some giant FinTech lending companies now have encouragement to identify the ability to repay debt by taking advantage of big data from their customers. Jack Ma, the former CEO of Alibaba, announced that Ant Credit Pay had had advanced technology to identify and classify the credit risk of its borrowers, and thus it can deliver quota to them without the "pawnshop mindset" from the bank, namely, pledge. Empirical evidence shows that the effect of borrowers' indirect information (such as the borrower's educational background, gender, and so on) on their credit risk using Y's real transaction data, and the results showed that borrowers' soft information (such as the borrower's educational background, gender, and so on) on their credit risk. The borrower's default risk is significantly reduced when they have access to information

As for the claim from the leading enterprise, they have already manipulated the technical methods to control the risk form the customers. And we simplify risk as bad debt risk, because most failure of the platforms is caused by bad debt. We might as well formulate the first set of hypothesis:
H1: Platforms with advanced FinTech tends to have lower risk.
H2: Platforms without advanced FinTech tends to have higher risk.

3.3 Risk Affected by Regulation

Apparently, the sector needs bilateral regulation. One is for the FinTech platform, the other is for the borrowers. On the one hand, FinTech should be regulated for its ability to cash out for the investors and the interest should be limited by government, on the other hand, the national credit system should be more improved to warn the customer their ability to repay the debt to prevent bad debts. And simplifying the risk as bad debt as well, we can formulate the second set of hypotheses:
H3: The implementation of strict regulatory policies lowers risk of platforms.
H4: The implementation of liberal regulatory policies enlarges risk of platforms.

4. Research Design and Sample Selection

According to the research methodology by Wang, data of 20 platforms from 2016 to 2018 was collected as the sample. The basic information data of each PEER-TO-PEER lending platform come from the CSMAR database and others are found in Google.

Due to time limitation, it is difficult to find assessment to mimic the development of FinTech, but giant companies tend to develop more sophisticated algorithm. And we define the size of the platforms as a substitution of FinTech, but still use FinTech as the variable. We value the biggest platform Ant Credit Pay as standard 1, then other platforms can derive a ratio by the value of each other platform to the value of Credit Pay. And since the severe regulation was legal after the implementation of law in 2017. We construct a 1-0 variable to mimic the effect of it, by marking the variable as 0 before 2017 and vice versa.

The important control variables at the macroeconomic development level and the PEER-TO-PEER platform company level were chosen based on the selection of control variables in earlier research, as well as the availability of data and probable multicollinearity difficulties. They are the

market size of whole mortgage in China (mt), average lending period (prd), the population of investors (invst), the population of borrowers (brrw), and cumulative repay (cp). All the definition of variables are listed in the appendix. The transaction volume, the number of investors, the number of borrowers, and the cumulative repayment are all treated as logarithms to avoid the regression result coefficient being excessively big due to the considerable difference in magnitude between the variable values. We estimate the following model by individual platform i and month period t.

$$risk_{it} = \alpha + \beta_1 FinTech_i + \beta_2 regul_t + \beta_3 FinTech_i \times reguli_t + \beta_4 control_{it} + \varepsilon_{it}$$

Using the residual ε_{it} of OLS estimation to estimate the covariance matrix of εit for GLS estimation, the empirical result is presented in the following table. The control variables are deleted in Model 2. And the descriptive statistics is shown below.

Table 1 Explanation of Variables

Variable	Note	Explanation
Bad debt risk	risk	The ratio of bad debt
Market size of mortgage	mt	The market size of whole mortgage sector
The level of FinTech capability	FinTech	A ratio of value of platforms works as substitution
Regulatory policy	regul	0 for before the regulation;1 for after the regulation
The population of investors	invst	
The population of borrowers	brrw	
Period	prd	Average time period of loan hold by borrowers
Cumulative repay	cp	The amount of repay left

Table 2 Descriptive Statistics

Variable	Mean	Standard deviation	Minimum	Maximum
risk	9.953	3.234	3.125	15.634
mt	14.453	0.098	14.356	14.563
FinTech	0.497	0.433	0.001	1
regul	0.721	0.543	0	1
Invst	9.232	2.098	0.001	12.321
brrw	6.328	2.893	0.001	11.673
prd	8.867	7.994	0.841	44.342
cp	12.093	1.032	9.313	15.233

Table 3. Intercorrelation of variables

	Model 1	Model 2
	risk	risk
FinTech	−1.0345***	−0.9759***
	(0.156)	(0.395)
regul	−1.363*	−1.193*
	(0.342)	(0.275)
FinTech×regul	−0.9891**	−0.8993**
	(0.452)	(0.764)
mt	−8.653**	
	(4.333)	
invst	0.1564***	
	(0.058)	
brrw	0.0786*	
	(0.042)	
prd	0.242**	
	(0.748)	
cp	−0.362***	
	(0.035)	
Adjusted R-Square	0.9032	
Observation Number	720	720

*p<0.1; **p<0.05; ***p<0.01.

5. Conclusion

The result shows that the variation range of the regression coefficient is not large, with or without control variables, indicating that the review results are stable. And the regression coefficient of FinTech is considerably positive in the table, demonstrating the validity of hypothesis 1, suggesting that the amount of financial technology decreases platform risk. On the contrary, due to the presence of a significant number of dangerous and uncertain consumers, the platform's poor technology level has resulted in a rise in the platform's bad debt risk, proving hypothesis 2 is correct. In terms of the impact of regulatory policy on the platform's bad debt risk, the table shows that regul is significantly negative at 10%, indicating that Hypotheses 3 and 4 have been proven. The degree of oversight is advantageous to the generation of high platforms. The danger of bad debts is reduced when the platform is gradually regulated. It can also be seen from the FinTech and policy intersection term that the two encourage each other in terms of risk reduction.

Although the performance of platforms is not as maniac as before under the three constraints of covid-19, macroeconomy, and regulatory policy, the slowing down of platforms is not a negative thing. People now have a clearer and more rational cognition of FinTech lending. The people have realized that the low threshold for borrowing will bring bad debt risks: the borrower needs to be cautious about their loan needs; investors have also realized that they need to delete and classify users to reduce the possibility of bad debts; the government has realized the need for bilateral supervision to standardize the behaviour of both parties to reduce the incidence of economic crimes and improve the vitality of the financial market. The next step, I believe, is to regulate how these platforms can collect the private data.

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