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Risk identification, future value and credit capitalization: research on the theory and policy of poverty alleviation by Internet finance

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Abstract

Background: Elimination of poverty is an important part to achieve a comprehensive well-off in China, and financial means and tool play an important role in it.

Methods: This paper employs credit capitalization model and future-oriented valuation method, uses the data from leading enterprise.

Results: There are some problems in current financial poverty alleviation practice, such as the lack of unified organization, high cost, poor sustainability, uncertain effects, etc. The internet finance, based on new information technologies which enable more comprehensive information collection of poverty population can help the poor households to accumulate credit capital and play a greater role in the process of poverty alleviation.

Conclusions: Although lack of physical capital, the poor people can still benefit from the financial market to get out of poverty and be better off with the support of credit capital through internet finance.

Keywords: Internet finance, Financial poverty alleviation, Poverty alleviation

Background

In 2015, the poor population of China in rural areas reduced by 14.42 million, which means that, to achieve the poverty alleviation target, China still need to reduce more than 10 million poor people every year in the "13th Five-Year" period. Bear in mind that the poverty reduction practice follows an order from easy to difficult because of the nature of poverty alleviation work, we should recognize that to liberate the remaining 56 million poverty people remains a very arduous task and that continued innovation is needed in participants and means and mode of poverty alleviation. To better achieve the goal of eliminating poverty, finance is an indispensable means. The Consultative Group to Assist the Poor (CGAP) of the World Bank believes that microfinance is a powerful tool for antipoverty. When the poor use financial services, they can increase revenue, build assets, and mitigate external shocks. Microfinance can make the poor families focus on the planning of the future (improve nutrition, living conditions, health, and education) rather than the daily life (CGAP 2004a). The Chinese government also attaches great importance to the role of finance in antipoverty process. In January 2014, the State

Council issued "Some Suggestions on Helping the "Three Rural" (Rural Industry, Rural Area and Rural Residents, or 3Rs) Development by Means of Financial Services" which requires the financial institutions to better perform in poverty alleviation in rural areas. In March 2014, the People's Bank of China (PBC) and other six ministries jointly issued a "guidance on the comprehensive work of providing financial services for poverty alleviation" which proposed the specific policies, measures, and arrangements for the work. On December 31, 2015, the State Council issued the "Development Plan of Promoting Inclusive Finance (2016–2020)" which puts forward that China should vigorously promote the development of inclusive finance.

There are many problems in the mode of financial poverty alleviation or poverty reduction, such as business difficulties, profitability difficulties, unrecognizable effect, and so on. However, Internet finance can help the poor households to accumulate credit capital and play a greater role in the process of poverty alleviation because of the value evaluation method focusing on future based on the more accurate risk identification.

This paper first analyzes the current paradoxes and problems of financial poverty alleviation mode and illustrates that, under current mode of financial poverty alleviation, there exist paradoxes of information, method, interest rate, profit, service network, and policy, which limit the large-scale promotion and implementation of financial poverty alleviation. And then, it analyzes the theory of Internet finance and reveals that, with a more comprehensive collection of poverty population information and value assessment method focusing on the future, Internet finance has the operation value and significance in poverty alleviation. Finally, it proposes some policy recommendations.

It should be noted that Internet finance is a very broad area, and this paper focuses only on the significance of P2P net loan for poverty alleviation. In fact, in the Internet financial field, crowd-funding model and other models may also play important roles in poverty alleviation. However, the number of cases and the overall size are quite limited (Zero One Research Institute 2016).[1] For this reason, these issues are not discussed in this paper.

The current situation and problems of the traditional mode of financial poverty alleviation

Financial poverty alleviation is a key work and also an important tool and means of poverty alleviation. Just as the CGAP pointed out in *Key Principles of Microfinance* that microfinance is a powerful tool for antipoverty and that poor people can increase revenue, build assets, and mitigate external shocks when they use financial services. Microfinance can help to liberate poor families from daily worries and to enable them to plan for the future, such as improving nutrition, living conditions, health, and education (CGAP 2004b).

The present situation of poverty alleviation finance in China

In recent years, poverty alleviation finance in China has been developing rapidly. Traditional finance and fiscal fund are the mainstream in poverty alleviation finance. In 2014, the central government allocated a special poor-aiding fund of 43.3 billion yuan, with a 10% increase over the previous year, to establish industrial development fund for the poverty-stricken areas, while provincial governments significantly increased their poor-aiding budget to 26.63 billion yuan, a 27.8% increase over 2013. At the same time, 832 poor counties have been credited a total loan of 800 billion yuan, with an increase

of 10% over the previous year. Among this sum of loans, 100 billion yuan of microloan was made with fiscal interest discounts which cost 4.944 billion yuan.

Commercial institutions also actively involved in the financial poverty alleviation. For example, in 2014, the Agricultural Bank of China (ABC) and the State Council Poverty Alleviation Office signed a cooperation agreement on financial poverty alleviation, focusing on industrial poverty and microfinance poverty alleviation cooperation. Under this framework, the total loans made by ABC in poor areas by March 2015 reached 1024.48 billion yuan, which showed a 51.92 billion yuan increase (or 5.34% in growth rate, 0.78% higher than that of the whole banking system) over the beginning of that year. Among this sum of loans, 463.3 billion yuan was made in the 14 contiguous extremely poor areas, with an increase of 23.1 billion yuan (or 5.25% in growth rate) over the beginning of that year.

However, as Yan (2015) showed, in general, the efficiency of traditional finance and fiscal fund in poverty alleviation in China is relatively low. There are 8–11.2 million poor families filed for microfinance assistance, accounting for some 30–40% of registered poor families. Their total demand for poverty alleviation microfinance was estimated somewhere between 300–500 billion RMB yuan. According to the survey by the People's Bank of China (Zhangjiakou Sub Branch, the People's Bank of China 2015), the total demand for microfinance was about 2.2 trillion in rural areas in 2013. Estimated in terms of the proportion of poor people, the demand for poverty alleviation microfinance in China would be around 400 billion yuan. The data between the two above are basically consistent, while our field survey showed that the satisfaction rate of poverty alleviation finance in China is still lower than 30%.

The problems of poverty alleviation finance in China

There are still a lot of problems in the practice of financial poverty alleviation in China.

First, there are insufficient professional institutions engaged in financial poverty alleviation. For commercial financial institutions, most of them have not developed professional financial products aiming to poverty alleviation suitable for the inherent futures of agricultural poverty alleviation, such as high risk, low yield, high cost, long cycle, complexity (customer information incomplete, geographical location remote), and so on. In practice, most commercial financial institutions just tried their existing products to financial poverty alleviation at a specific time and region; therefore, there is no long-term mechanism and these practices are hard to extend.

Second, the cost of financial poverty alleviation is high. Loans related with poverty alleviation are always small and the cost of small loans is much higher than that of the large credit. CGAP (2004b) found that the average cost of small credit is even much higher than large credit. Since most of the financial poverty alleviation needs to face poor areas and poor households usually living in places where the traffic is extremely inconvenient, the cost of investigation for poverty alleviation loans is much higher than the general loan. Our nationwide survey found that the cost of each microcredit lending is up to 5000 yuan, which means that, if the average loan amount is 30,000 yuan, the cost of credit lending could accounts for as much as 1/6 of the principal. This is a huge number. Another factor leading to high cost is the low repayment rate.

Research from the CGAP pointed out that in a subsidized lending program, borrowers generally view the government's soft loans as a subsidy or a donation and they tend not to repay the loan. This is proved in the practice in China in that the repayment rate of the policy support poverty alleviation loans is far lower than the general commercial loans.

Third, the sustainability of financial poverty alleviation needs to be further investigated. Sustainable financial poverty alleviation cannot be maintained easily due to its characteristics (Bond 2006). Because of the high cost and high risk of poverty alleviation, there can often be a trade-off between higher goal of poverty alleviation and sustainable finance constraints, which leads to the problems of the sustainable development of the poverty alleviation finance. For some commercial loan for poverty alleviation supported by policy, the defective rate may be as high as 50%. The development of this financial model cannot last once the relevant policy support is lacked. The sustainability of other models needs to be tested as well. For example, the mutual-aid-featured "Yancheng model," the farmers' finance cooperative model, has encountered many problems because of internal control, external supervision, and other reasons, and its sustainability needs to be further observed[2].

Fourth, the effect of financial poverty alleviation is still in doubt. Whether financial poverty alleviation can help poor people out of poverty or not has been controversial in the academic circle. A large number of studies showed that the existing models of poverty alleviation cannot contribute to poverty reduction. The main bodies carrying out the poverty alleviation work in China are commercial organizations and local governments, which, in seeking identified effects, tend to supply poverty alleviation loans to large specialized households or infrastructure construction rather than the really poor households. It is reported that the National Audit Commission has found that the poverty alleviation funds for many poor areas were diverted or misappropriated to the rich.[3] Zhang and Hu (2011) pointed out that only less than 1% of the farmers get the poverty alleviation loans in 2001.

Fifth, the approach and pattern that Internet financial alleviated poverty is still not clear. Internet financial obtained rapid development in China since 2013. For example, the cumulative turnover peer-to-peer loan (P2P) would reach 3 trillion yuan by the end of 2016. But Internet financial did not make due contribution to poverty alleviation.

The theoretical basis of Internet financial assistance to poverty reduction: risk identification, future value, and credit capitalization

The root reason why there are many problems in financial poverty reduction lies in two aspects. One is the complex of financial poverty reduction itself. The complex embodies mainly that it is difficult to determine the collateral and its value. The loan management is also difficult due to the small amount of loans and the scattered location of the borrowers. In addition, the poor households generally lack credit record, and it is very difficult to evaluate the credit risk. If the borrower fails to repay the loan, it is very difficult for the lender to recover its losses from the collateral due to the special characteristics of the collateral involved. The other is that financial institutions, under current financial development mode, are unable to accurately identify the borrower's risk characteristics, let alone the adoption of the evaluation models based on future value. As a

result, when the loan resource is limited so that allocation is adopted, the really poor people are first denied from the financial market. To solve the existing problems of financial poverty alleviation, China should work hard on risk identification, value assessment, and credit capital establishment.

The theoretical analysis of financial poverty alleviation: credit rationing under the inability of risk identification

With the existing financial risk evaluation model, financial institutions in the loan market often cannot distinguish "good" borrowers who are honest and preparing for repayment from "bad" borrowers who has low credit and do not intend to repay the loan. Therefore, they relate interest rate to the average credit quality of all borrowers and take it as the basis of credit rationing combined with the quality of the assets the borrowers possess. However, in the financial market, raising interest rates does not always lead to credit market clear. If the financial institutions set interest rates in accordance with the average risk, low-risk borrowers ("good" borrowers) would seek other channels of financing. On the other hand, high-risk borrowers ("bad" borrowers) are not interest-sensitive because they have no intention of repayment. High interest rate will thus exclude the low risk borrowers from the market, which in turn leads to greater risk of financial institutions greater. Therefore, financial institutions are reluctant to engage in such business, which would make the market to be a "lemon" one.[4]

On the other hand, higher interest rates enable the banks to earn more interest from the borrowers and lower borrowers' expected return. In such circumstances, the borrowers may often take greater risks to improve their situation, resulting in higher probability of default and the banks' expected losses. When the latter effect is strong enough, it will reduce the expected profit of the bank in general.

In order to solve the problem of lemon market, the banks took credit rationing instead of the interest rate as a means to adjust the market equilibrium. The logic of credit rationing is granting loans only to a small part of customers who can meet the bank risk management requirements rather than all the customers with repayment ability. In the case of asymmetric information, credit rationing is a basic tool for banks to control credit risks, and it is a long-term equilibrium of credit under the banking system.

In the context of credit rationing, banks are able to fully select customers. Moreover, due to the limitation of the existing bank liability system and the risk assessment model, the bank will give more loans to customers with assets mortgage. In this way, it is very difficult for the poor lacking of collateral assets to obtain credit support.

Assuming an area with 10,000 potential customers from whom 20% are low-risk borrowers ("good" borrowers) with collateral assets, 60% of the customers are low-risk borrowers ("good" borrowers) including the poor (20%) and the non-poor people (40%). The remaining 20% are high-risk borrowers (bad borrowers) with both the poor and the non-poor people each accounting for half. The entire loan market is thus structured like this: 70% of the market customers are non-poor people (of which 10% are high risk borrowers) and 30% are the poor (of which 10% are high risk borrowers).

Banks may have two strategies:

The first is to increase lending rates to over 20% and to provide loans to all borrowers. In this case, all people are able to borrow money, and finance can help two thirds of the poor people out of poverty. However, the key is that the interest rate more than 20% will force a lot of good borrowers to exit the market and seek other sources of funds. In this way, the banks' risk will increase and the higher interest rates may not be able to cover the cost of its risk. So the banks will not take this strategy.
The second is credit rationing. The best plan is to identify 80% of the entire population of low-risk borrowers (good borrowers) and provide them with loans. However, judging from the reality of the risk assessment model, this is only an ideal situation. The banks' assessment models are incapable to identify these low-risk borrowers. As a result, the banks' strategy is to simply provide loan support to the 20% customers with collateral assets. That is to say, it can only meet the needs of 1/4 of the market. In this way, the poor have no access to loans, and finance has no support for poverty alleviation at all.

Risk identification, future value, and credit capitalization: the theoretical foundation of poverty reduction through Internet finance

(1) Screening out the borrowers who need the loan and have the repayment ability

In studying financial poverty alleviation, there is an essential point that needs to be made clear that the object of poverty alleviation loan are the poor who have the development potential. Supplied with funds they lack at present, they are able to make a success and repay the principal and interest. It is important that the poor can get poverty alleviation loan; however, without the consideration of repayment risk, inclusive financial loan support would be confused with poverty relief. That is to say, it is needed to identify the poor who have the repayment ability and give them the appropriate financial support. Most of the existing financial risk models focus on hard information[5] because of the low cost of collection. What is more, as structured data, hard information is also suitable to be processed in the existing risk assessment model. However, the poor often lack such hard information so that it is difficult to incorporate them into the formal financial perspective. Therefore, in the Internet financial poverty alleviation, it is particularly important to establish a risk identification mechanism based on the combination of hard and soft information.

First, a set of risk assessment models based on both soft information and hard information has been established for Internet finance. In these risk assessment models, soft information mainly includes information related with personal social relation network, social spheres of communication, personal character, etc. For example, YILONGDAI (http://www.eloancn.com/), which is engaged in agriculture and rural finance, has included more soft information into its risk assessment model.

Second, the unique information screening mechanism. There are many other links in capital supply and demand sides in addition to the credit link in rural areas, such as production, trade, information, and even family ties. Through the

online and offline linkage mode (O2O), Internet banking can ensure the borrower's of even more effective supervision than the regular finance.

Third, Internet banking can take advantages of information transmission by network to establish Internet credit mechanism. Traditional financial institutions emphasize that credit be based on assets, while the foundation of the Internet credit is transactions. The Internet has the advantage in dealing with dynamic transaction data so that commercial credit can be incorporated into the risk assessment model. For example, some financial models based on Big Data from E-business have been proven to be more effective in the application process.

(2) The credit value assessment based on future

At the present stage of development, financial institutions engaged in poverty alleviation have not developed financial evaluation model based on the special needs of poverty alleviation; instead, they just applied their traditional assessment models which are basically designed to serve those classes with assets lacking of liquidity. It is natural that these assessment methods would lead to deviation from the original goal of poverty alleviation finance. In the traditional financial assessment framework, the definition of "poor" itself means that the people are in difficult financial position and hence they do not meet the requirements of the existing assessment methods. Poverty alleviation finance requires that we change our idea of wealth. We should assess the "poor" using other set of evaluation concepts, which requires that a new set of risk assessment methods based on the future be established. In other words, only to look at the future of existing "poor" can we assess whether they meet the criteria for financial support or not. In terms of credit value assessment, existing financial institutions lay their cornerstone on current situation rather than on the future, so that the poor people are excluded from the financial market. To improve the situation, a new set of risk assessment models based on the future value is needed.

The common characteristic of the poor is that they lack wealth judged by the current assessment benchmark. However, when lending money to the poor through the financial support, the real issue that needs attention is whether they have the ability to realize future wealth appreciation. That is to say, it is needed to establish a risk assessment system based on the future value discounted to the present. Here again, the existing valuation systems of the future value discounted to the present are based on the hard information like financial statements.

On the basis of collecting software and hardware information, it is possible for Internet banking to build a credit assessment model based on the future value. The theoretical basis of this prototype model has already been developed. As a global complex network research authoritative, Albert László Barabási (2010) pointed out that 93% of human behavior is predictable based on the big data analysis. This predictability determined that Internet finance can provide more financial services for the poor people with potentiality through the risk assessment model established on the basis of future.

(3) Credit capitalization: support for the poor people to get more financial services

The role of credit in the social economy and its sustaining mechanism is in gradual evolution. In the age of natural economy, credit is moralized and credit depends on morality to maintain. On the other side, an individual's credit status also directly determines his moral evaluation in the collective. In the era of commodity

economy, credit became a commodity, which can be turned into an asset by establishing a model based on the existing information of the individual. In the Internet era, credit will be capitalized. Credit capitalization actually contains multiple meanings. First, credit evaluation is not only based on the information of current situation, but more importantly, it can determine a person's future income. That is to say, credit is in fact a kind of capital. This is because the entire life of the individual can be exposed by the big data in the Internet era. If an individual lacks credit, then he or she cannot continue to live in the entire life scene. Secondly, credit determines the individual's communication process. This is because in the WEB2.0 era, communication has become a way of life. In this situation, it is difficult to exchange with others without credit. Credit also determines the personal life of the exchange. Therefore, the construction of credit capitalization theory is an important requirement for Internet financial poverty alleviation.

Credit capitalization is of great significance for Internet banking in poverty alleviation. At present, the majority of poor people are unable to obtain financial support because of the lack of corresponding credit records. Therefore, relying on big data technology and be coupled with the O2O business mode, Internet finance can help poor people to build credit capital. After having obtained credit capital, poor people will not only be able to get the support of Internet banking but also to get the foundation for their formal financial support.

From a deeper instructional perspective, for Internet finance to help the poor to establish credit capital, it is essential that new models for Internet financial risk assessment and credit assessment be established or improved.

We can use the iceberg model of credit assessment to explain credit capitalization theory based on the big data.[6] In traditional risk assessment models, the rating agencies put forward their own point of view according to the known information. This known information can be seen as part of an iceberg on the surface of the water, but most underwater information are not obtained or used. In a person's information iceberg, the top level is a hard asset, such as his assets, and the lower level is his ability capital, including its income status, educational level, and other factors. This is a part of the iceberg under the water. Unfortunately, the ability capital information of the poor people is difficult to obtain and even lack. In the Internet era, the information of the iceberg hidden beneath the surface can be mined through the Internet communication circle, daily communication habits, contacts or interactive records, personal life trajectory, etc. That is to say, the social visualization in Internet era make social contact be a part of credit assets, which constitute the theoretical basis of credit capitalization.

Under the support of credit capitalization theory, the development of Internet finance in the poverty-stricken areas will shift from the trading pattern (provide appropriate financial services for the poor and incorporate them into the financial service system) to the supply chain (incorporate the poor people into a specific supply chain), and then from the supply chain to virtual community (build a virtual community based on the transaction, production and life for poor people), and then from the virtual community to social capital (the expansion of the contacts circle of poor people will form a certain social capital). Undergoing these three changes, consumers will be able to turn their credit into a capital, so as to achieve the process of credit capitalization.

The policy requirements for Internet finance in poverty reduction

From the previous analysis, we can see that Internet finance can play a very important role in poverty reduction. For example, the accelerated development of the mobile Internet[7] brought about a rapid decline in the operating costs of finance; at the same time, it also made it possible for new solutions of finance for poor areas. GCAP put forward that wireless technology may be a more important solution to realize financial inclusion (CGAP 2006).

There have emerged numerous modes of internet financial poverty alleviation, such as the localization mode, the O2O mode, the supply chain mode, and the internet information advantage mode, just like YILONGDAI (http://www.eloancn.com/). Yet the overall size of internet financial poverty alleviation is still small.

Taking possible preferential arrangements for internet financial poverty alleviation, we suggest that more internet financing models be encouraged with policy support, just like P2P, crowd funding.

First, it is required to support all institutions involved in internet financial poverty alleviation to establish a set of databases. Compared with traditional finance, the advantage of internet finance is that, in addition to a more effective financing network it enabled, it can modify and improve traditional financial risk assessment model with new technologies such as big data mining. Through these modification and improvements, it is possible to establish a risk assessment model based on future repayment ability rather than hard information risk assessment model based on existing assets. The newly established models need to work with a lot of related data. However, at the current stage of development, data about the poor is separately and partially possessed by government departments (such as the department of agriculture, poverty alleviation department), commercial institutions (such as rural retail enterprises, supply and marketing cooperatives), social network companies, basic telecom operators, e-commerce companies, and so on. While the data exist in the form of isolated islands, internet financial enterprises need to integrate them in risk assessment. For data integration, individual companies are helpless; it is the responsibility of government departments to make proper policies for the establishment of open public databases that can be used by enterprises involved.

Second, the government needs to help the internet financial enterprises to reduce the risk of poverty alleviation. Poverty alleviation finance is mostly related to agriculture, and agriculture-related finance itself has a very high risk. There are multiple risks rooted in agriculture. The first is the natural risks, climate, plant diseases and insect pests, and other severe weather affects crop production; in the worst cases, these may cause severe disasters. The second is market risks. Agricultural production cycle is long; the supply cannot quickly adapt to demand changes, so that there could be volatile prices. With insufficient information and communication infrastructure, the market of rural product is imperfect. Crop price is not predictable at the sowing season, but it will be determined by the situation of supply and demand in either domestic or global market. Market risks also result from the farmers' planting strategy. In many cases, when too many farmers adopt the high-risk high-reward strategy on a certain crop, they are very likely to encounter market risks. The third is political risks. Agricultural products are subject to the most international trade restrictions, the exports are

vulnerable to restrictions, and the international market is difficult to expand. In domestic market, since many agricultural products are related to the basic livelihood of the people at some point, government may try to limit the price for political reasons. These risks will be reflected in poverty alleviation, forming special risks of internet financial poverty alleviation. Therefore, it is needed to establish a wide range and multilevel risk-sharing mechanism. This risk-sharing mechanism needs the extensive participation of government departments, public welfare organizations, insurance agencies, and other departments.

Third, it is required that the government makes optimal policies to reduce the operation cost of internet finance. At the earlier stages when internet finance poverty alleviation is initiated, customers from the lending side are doubtful about the poverty alleviation funds, which would result in higher risk cost in obtaining the capital. At the same time, it is impossible to exercise risk control relying solely on the online model because of the lack of data. So a large number of field surveys are needed. Since that the residences of poor are usually scattered and the transportation infrastructure in these areas is often poor, the operating cost of poverty alleviation is very high. (For instance, in our field investigation, in order to visit two loan borrowers located 20 km away between them, we spent 2.5 h to drive from one borrower to the other.) Since the amount of each single poverty alleviation loan is very small, it will add up to a very high comprehensive cost. High cost can form heavy burden for the borrowers as well as increases financial risks (because the borrowers may take high-risk high-reward planting or breeding strategies). In order to lower the operation cost of the Internet finance, the government needs to provide more policy support in cost subsidies, tax incentives, public facilities, and other aspects, so that the poverty alleviation finance can effectively serve the poor. Since 2010, the Ministry of Finance and the State Administration of Taxation granted the Agricultural Bank of China (ABC) business tax preferential policies for its 3Rs departments at the county level branch office in pilot counties. On April 29, 2015, the PBC issued the *Notification about Comprehensively Advancing the Reform of ABC's 3Rs Financial Departments* which reaffirmed that all 3Rs departments at the county level branch office in selected counties continue to enjoy tax preferential treatment. Now that ABC, as a state-owned listed commercial bank, can enjoy preferential policies, other enterprise involving loan business or poverty alleviation business in rural areas, such as internet financial enterprises, should also be given the same preferential treatment.

Fourth, the interactive mechanism between fiscal poverty alleviation and internet financial poverty alleviation should be actively explored. Up to now, the government has actually inputted a large amount of money in poverty reduction. However, this money appeared to be a one-way flow in the form of one-time fiscal aid. In fact, it seems that government fund has been going alone in poverty alleviation. We suggest that fiscal funds for poverty aid be combined with Internet finance so as to further improve the performance of fiscal funds in poverty alleviation. For example, the fiscal fund for poverty alleviation can be used as a reserve fund, once the Internet financial fund bears a loss, it can be partly compensated from the reserve fund. It is also possible to form a structured loan with fiscal funds and Internet financial fund. In such a structured loan, fiscal fund can be defined as inferior. For example, in a loan portfolio worth of 1 million yuan, 800,000 yuan is raised from Internet finance, and 200,000 yuan is

from the fiscal fund. When the repayment amount is less than 800,000 yuan, it will be repaid back to investors of Internet finance. Only when the repayment amount is larger than 800,000 and that and investors be fully repaid can the fiscal funds be recovered. In this way, fiscal fund can be made more effective in poverty alleviation; besides, it can attract and employ more social capital for the purpose of poverty alleviation.

There have been a number of tentative cases of this approach. For example, in accordance with the requirements set by relevant government departments, the Poverty Alleviation Office, Fumeng Country, Fuxin City, through its Federation of Poverty Alleviation Funds Cooperatives, was authorized to allocate 4 million yuan national fiscal funds for poverty aid. In order to ensure the performance of this poverty alleviation fund, they decided to introduce a solution that can change the poverty alleviation approach from blood transfusion to hematopoiesis, so they choose to cooperate with YILONGDAI (http://www.eloancn.com/). After more than half year's preparation and consultation, the Poverty Alleviation Office provides a list of identified poor households to the local Yilong Loan Centre, which uses it own risk assessment and controlling model, and would then screen and finally choose from the list. Both parties worked together through the whole process from the beginning to repayment. Each poor family selected would be eligible to get a structured loan, composed of fiscal fund from the Poverty Alleviation office (not more than 20,000 yuan for 1 year at a rate of 7.2%) and social capital from YILONGDAI (http://www.eloancn.com/) (not more than 60000 yuan for 1 year at a rate of 18%). As of January 31, 2016, the Poverty Alleviation Office and YILONGDAI (http://www.eloancn.com/) have jointly credited 17 poor households with the structured loans, of which 340,000 yuan fiscal fund was used. It is expected that a total of 4 million yuan of fiscal funds will be paid out in July.

There can be more innovation and improvement on this type of enterprise linkage in the future. Since there will be combined the advantages, namely, higher efficiency from the Internet finance and public welfare seek by the poverty aid fiscal fund, the performance of poverty aid fiscal fund is expected to improve, and Internet fiancé is expected to play a more important role in its mission of poverty alleviation.

Conclusions

In conclusion, there are some problems in current financial poverty alleviation practice, such as credit rationing, high cost, poor sustainability, and uncertain effects. The banks tend to directly provide the mortgage loan because of lack of risk identification ability. This makes no contribution to poverty alleviation because the poor have no assets for mortgage. The Internet finance, based on new information technologies which enable more comprehensive information collection of poverty population and employ future-oriented valuation method, can help the poor households to accumulate credit capital and play a greater role in the process of poverty alleviation. In this way, although the poor people lack of physical capital, they can still benefit from the financial market to get out of poverty and be better off with the support of credit capital. Based on this theory model, we also put forward some policy recommendations to support Internet finance poverty alleviation.

Endnotes

[1]According to "China Internet Crowd-funding Annual Report (2015)," cumulative fundraising through crowd-funding with all kinds of products is 3 billion RMB Yuan and that with stock share is somewhere between 5–5.5 billion RMB Yuan. In contrast, the size of P2P net loan is more than 1100 billion RMB Yuan, which is far more than the amount of the crowd-funding.

[2]http://money.163.com/15/1124/13/B96KG15D00254TI5.html.

[3]http://view.news.qq.com/original/intouchtoday/n3407.html.

[4]The lemon market, also known as defective market, refers to the market of information asymmetry, namely that the seller has more information about the quality of products than the buyer in the market. In 1970, Akerlof published "the market for Lemons: quality uncertainty and the market mechanism" which, using a second-hand car market for case study, was a classical analysis of this phenomenon.

[5]Hard information mainly includes financial statements, assets appraisal reports, operating conditions, and collateral. which can be directly quantified. In data processing, all information like these is structured data and is very convenient for model processing.

[6]The iceberg model of credit evaluation is proposed by Yongjian Li, one of the authors of this paper, to establish a framework for individual credit evaluation based on big data.

[7]According to statistics, by the end of 2015, China had 620 million mobile Internet users, accounted for more than 90% of the total number of users. Moreover, the mobile Internet users are far more than the number of users on PC.

Abbreviations

3Rs: Rural Industry, Rural Area and Rural Residents; ABC: The Agricultural Bank of China; CGAP: The Consultative Group to Assist the Poor; PBC: The People's Bank of China

Authors' contributions

All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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