Exploration on Risk Management of China's Financial Industry under the Internet Economy

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Abstract: The objective of this research is to explore the risk management methods of China's financial industry under the Internet economy. In this study, Internet financial products can be divided into three categories according to financing methods, issuing subjects and platform functions based on a large number of literatures combined with China's national conditions. That is, balance, P2P and crowd funding; financial institutions and non-financial institutions; information services and publishing asset management. Then the risks of Internet financial products were divided into four types: return volatility risk, liquidity risk, policy and institutional risk, and security risk. In this research, by studying the volatility of the yield of 10,000 shares per day from December 26, 2016 to December 15, 2018 of Yu'E Bao, it was found that balance financial products with stable returns still had the risk of fluctuation of returns. Based on the above analysis, in this research, preventive measures for Internet finance industry from the aspects of financial product quality and service, government, and investors were put forward, which had certain reference significance for future risk management of this industry.

1. Introduction

With the rapid development of the Internet industry, an innovative mode combining Internet and financial industry has been formed [1]. Internet finance developed early in foreign countries, and some foreign scholars defined Internet finance as electronic finance or digital finance, which is a way of financing for the public by combining monetary services, banking services, payment functions and transaction functions with the Internet as the medium [2]. Shahrokhi proposed that electronic finance was the third financial operation mode [3]. The development of the Internet finance industry is followed by the risk factors it brings, including information technology security issues, whether the Internet technology is mature, lack of comprehensive risk control system, real regulatory agencies, and corresponding legal support, etc. [4-7]. At present, the research theories of risk exploration of Internet finance industry in China are relatively single and lack of systematization [8, 9]. Foreign studies are systematic and rich, but they are based on the international environment, some aspects are not applicable to China.

Therefore, in this research, on the basis of a large number of domestic and foreign literature combined with the national conditions of China's Internet finance research, the risk management methods of China's Internet finance were explored.

2. Methods and Materials

2.1 Literature research method

In this research, a large number of literatures related to the Internet financial industry were read and summarized by websites such as CNKI and Wanfang database. The concept of current Internet financial products was clarified, all kinds of Internet financial products were classified, and the risk factors of these financial products were analyzed.

2.2 Financial product risk research method

In this paper, based on the literature research method mentioned above, a large number of

literature and website data materials were used to conduct qualitative analysis on various types of Internet financial products, and the potential risks of these financial products were summarized and analyzed.

2.3 Empirical approach method

In order to further explore the risk management methods of China's Internet finance industry, based on the relatively stable performance of Yu'E Bao income volatility risk return rate, Yu'E Bao financial products of alipay group was taken as the research object. Through empirical analysis of 720 consecutive data of 10,000 daily returns from December 26, 2016 to December 15, 2018 published on Tiantan fund website, the volatility of the yield of this wealth management product was studied. According to the ARMA autoregressive moving average model, the volatility of earnings of Yu'E Bao was studied.

2.4 Overall technology roadmap

The overall technology roadmap of this research is shown in figure 1. And this study was carried out according to the procedure described in figure 1.

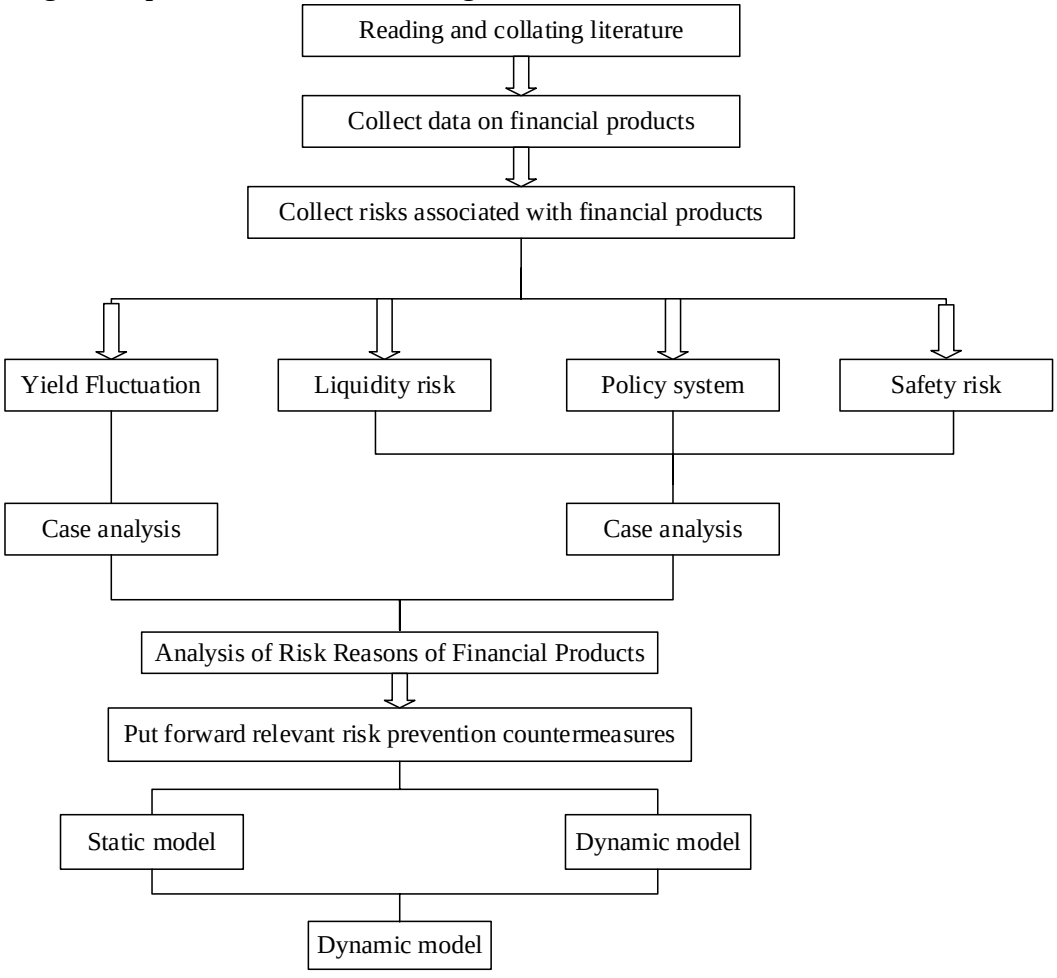

Figure 1. Overall technology roadmap

3. Results

3.1 Classification of Internet financial products

Based on literature research method, a large number of literatures were analyzed, and it was found that China's Internet financial products can be divided into three categories according to financing methods, issuing subjects and platform functions, as shown in table 2.

According to the financing mode, it can be divided into balance products, P2P products and

crowd-funding financial products. Among them, balance financial products, such as Yu'E Bao of alipay, are usually the cooperation between Internet companies and fund companies. Users can purchase fund shares with the balance of their accounts and wallets and obtain corresponding income, which is characterized by direct consumption. P2P financial products, such as Lufax, launched by Ping An group of China, usually release fundraising information for Internet P2P platforms. Investors carry out the financial mode of capital through P2P platforms, and the capital circulation is completed through the platform, but they do not participate in the transaction of capital. In a broad sense, crowd-funding financial products refer to crowd-funding by debt, crowd-funding by equity, crowd-funding by product and crowd-funding by gift, etc. In a narrow sense, it refers to crowd-funding by equity, such as "crowd-funding by Taobao" launched by Alibaba group.

According to the issuing body, it can be divided into financial institutions and non-financial institutions to issue financial products. The former, like banking APP, is an online financial product provided by banks and other financial institutions, and the latter refers to Internet financing.

According to the function of Internet platform, it can be divided into information service category and issuing asset management category. The former, such as “Jianxin Feiyuebao for the Aged”, is based on the Internet platform as a medium. The latter refers to the mobile application software and portal websites of commercial banks and other financial institutions, such as “yyfax”. Different from the information service category, the issuer and platform of the latter are the same subject.

Table 1. Classification of Internet financial products

Group	Classification	Example
Way of financing	Balance	Yu'E Bao, Money for mac
	P2P finance	Lufax, Renrendai
	Crowdfunding	Taobao crowdfunding
Issuer	Financing institution	APP of bank
	Non-financial institution	The Cube
Platform function	Information service	Jianxin Feiyuebao for the Aged
	Assets management	yyfax

3.2 Risks of Internet financial products

First, volatility risk of yield. In the background of the upward macro economy, due to the large demand for funds by financial institutions, the interest rates of deposits and inter-bank borrowing have been raised, which is one of the reasons for the generally high interest rates of Internet financial products. However, when the macro economy goes down, the investment income advantage of fund institutions disappears and the profits decrease. Internet platforms lose users and potential customers when dividends fail to satisfy depositors or investors. Relative to investors, this situation has a large volatility risk.

Second, liquidity risk. For investors, liquidity risk is the risk that after purchasing financial products, when the products mature or are cashing out, the financing party can’t meet the investors' demand for cash due to various internal or external investment environment. The liquidity risk of Internet financial products can be divided into acceptance risk and operation risk of Internet financial management platform. In the balance financial products, the essence is to invest in the money market fund, so the acceptance risk becomes the redemption risk of the money market fund. In the P2P financial management products, due to the special nature of this financial product as an intermediary only, investors would face the risk of acceptance of principal loss when the financing party can’t exchange funds for various reasons.

Third, policy system risk. China is a socialist country and implements the socialist market economy system. The macro-control of the country is of great significance to the market economy. Therefore, the policy and institutional risks of China are particularly important. It can be divided into two categories: policy orientation and non-compliance risk. The former refers to the state's development of a corresponding policy system based on market demand to macro-control the market

economy. Therefore, when the national policy changes, investors need to bear the resulting risks. The latter refers to the risk that the Internet financial management platform or the financing party may damage the interests of the investors in order to comply with regulations or industry standards in the operation and operation process.

Fourth, security risks. With the development of the Internet, the number of Internet users, Internet payment means, and Internet financial products has greatly increased. They also bring Internet security risks, including investor information security, investment and payment security, and fund storage security. In the process of payment, the disclosure of personal information, dynamic payment password, payment QR code, bank card, credit card and so on will bring unnecessary losses to investors.

3.3 Analysis of the risk of fluctuations in yield

In this research, 720 consecutive data of Yu'E Bao published on Tiantan fund website were analyzed from the daily income of 10,000 shares from December 26, 2016 to December 15, 2018, so as to obtain the yield data of Yu'E Bao and analyze the volatility of its yield. Firstly, the data set was denoted as {Y}, and then the time series data of these continuous data {Yt} were plotted to intuitively show the volatility of Yu 'E Bao's earnings and analyze the yield trend. It can be observed from figure 2 that the trend chart can be divided into two parts. The first part was from December 26, 2016 to March 20, 2018. During this period, Yu 'E Bao had obvious income fluctuation, but the income basically maintained at more than 1 yuan per 10,000 shares and showed a small increase trend. The second part was from March 20, 2018 to December 15, 2018. It can be concluded that the earnings of 10,000 shares of Yu 'E Bao in this period had a significant downward trend in fluctuations.

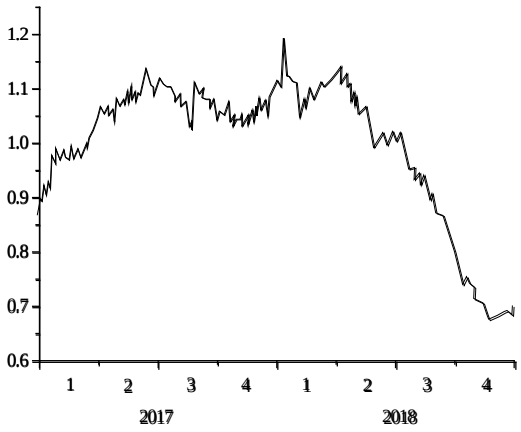

Figure 2. Yield trend chart

According to the above data, Bviews8 software was used to draw the yield difference diagram. According to figure 3, it can be observed that the yield of Yu'E Bao fluctuated in a relatively stable range in these two years. Even so, there was still a phenomenon of large fluctuations followed by small persistent fluctuations.

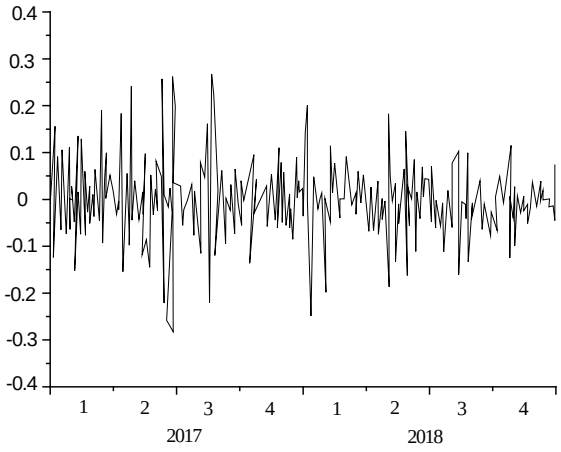

Figure 3. Yield difference diagram

In this research, the correlation diagram and partial correlation diagram of Yu'E Bao difference sequence Dy_t were used to further analyze the difference order and stationarity of the model. After analysis, it was found that time series correlation graph of Yu'E Bao's ten thousand shares had the characteristics of slow attenuation, and its partial correlation graph had the characteristics of the first phase truncation. Therefore, it can be concluded that the first order truncation of partial autocorrelation of the model and its return time series were the first order autoregression process. In order to better fit the model, AR(1) model of $Dlny_{t1}$ and AR(1) model of $Dlny_{t2}$ were respectively established according to the two time periods in figure 2. Firstly, the data were processed (logarithm was taken to reduce the autocorrelation of time series), then the processed data were denoted as $\{lny_{t1}\}$ and $\{lny_{t2}\}$, and the AR(1) model and AR(1) model were respectively output by software, as shown in table 2 and table 3.

Table 2. Test results of sequence Dlnyt1

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	0.001270	0.000346	3.671380	0.0053
AR (1)	-0.138903	0.046888	-2.962427	0.0032
R-squared	0.419297	Mean dependentyar		0.000577
Adjusted R-squared	0.417098	S.D.dependentyar		0.008403
S.E.of regression	0.008331	Akaikeinfo criterion		-6.733283
Sum squared resid	0.030953	Schwarz criterion		-6.714958
Loglikelihood	1510.255	Hannan-Quinn criter		-6.726059
F-statistic	8.775973	Durbin-Watson stat		2.018932
Prob (F-statistic)	0.003215			
InvertedAR Roots	-44			

Table 3. Test results of sequence Dlnyt2

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	-0.001857	0.000296	-6.267311	0.0000
AR (1)	-0.138903	0.046888	-2.962427	0.0000
R-squared	0.574696	Mean dependentyar		-0.001857
Adjusted R-squared	0.571243	S.D.dependentyar		0.006432
S.E.of regression	0.006198	Akaikeinfo criterion		7.321664
Sum squared resid	0.010297	Schwarz criterion		-7.295009
Loglikelihood	990.4247	Hannan-Quinn criter		-7.310961
F-statistic	21.63444	Durbin-Watson stat		2.023459
Prob (F-statistic)	0.000005			
Inverted AR Roots	-27			

According to table 2, it can be observed that the constant term was positive and significant with

the first-order difference coefficient t value, indicating that the initial Yu'E Bao income per 10,000 shares was more than 1 yuan. The first-order difference coefficient was negative, indicating that investors' returns had a decreasing trend and were faced with fluctuation risks. The DW value was 2.023459, indicating that the autocorrelation of time series was eliminated and could pass the test. The result of its time series model is shown in equation 1.

$$Dlny_{t1} = 1.27 \times 10^{-3} - 0.1389\left(Dlny_{t1} - 1.27 \times 10^{-3}\right) + \mu_t \quad (1)$$

According to table 3, it can be observed that the constant term was significant with the first-order difference coefficient t value, and the DW value was 2.023459, indicating that the autocorrelation of time series was eliminated and could pass the test. The result of its time series model is shown in equation 2.

$$Dlny_{t2} = -1.857 \times 10^{-3} - 0.2733\left(Dlny_{t2} + 1.857 \times 10^{-3}\right) + \mu_t \quad (2)$$

Among them, the coefficient of $Dlny_{t1}$ was negative, indicating that the late income was lower than the early income. Investors' returns gradually decreased, indicating that investors were facing the risk of earnings of balance financial products.

4. Conclusion

Internet financial industry is a new industry combining Internet technology and traditional financial industry, which is not simply added, but an organic combination of injecting Internet operation thinking into traditional financial industry, which is a new model. In this research, through literature reading method and combined with China's national conditions, Internet financial products were divided into balance products, P2P products, crowdfunding products, financial institutions, non-financial institutions, information services and issued asset management products. On this basis, the risks of Internet financial products were summarized, which can be divided into four types: return volatility risk, liquidity risk, policy and institutional risk, and security risk. Empirical research method was applied to study the volatility of the yield rate of 10,000 shares per day from December 26, 2016 to December 15, 2018 of Yu'E Bao. It was found that balance financial products with stable returns still had the risk of fluctuation of returns. Based on the above research results and the actual situation in China, suggestions on risk management of financial industry in China's Internet economy can be put forward from the following aspects. First, the quality and service of Internet financial products: the operation ability and risk management ability of the Internet financial platform were improved to prevent the return risk; the professionalism and self-discipline of financial management on Internet financial platforms were improved to prevent liquidity risks; and the Internet security technology budget was increased to guard against security risks. Second, the government: the market interest rate was fully considered and adjusted smoothly to prevent the return risk; clear laws and regulations were introduced to prevent liquidity risks; information security measures were upgraded and regulatory models were strengthened to guard against security risks. Third, investors: knowledge, national policies, and guidelines related to Internet finance were learned to prevent risks and benefits; investment projects were fully understood and investment structures were reasonably planned to prevent liquidity risks; and personal information protection awareness and investment awareness were enhanced to prevent security risks.

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