Statistical Analysis of Internet Financing Model Based on Maximizing the Effect of Financing System

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Abstract: With the development of Internet finance, the Internet financing model has also been continuously innovated. This paper analyzes the key elements of the Internet financing model which include the financing demand side, the investment platform and the entity who provide cash flow, and establishes the pricing model of the Internet financing model. On this basis, it analyzes the model of the entity who provide cash flow gain profits from financing, the model of the effective guarantor gain profits from financing and the revenue of financing platform, and the factors which influence the maximizing the effect of financing system to improve the practical use of the Internet financing model.

1. Introduction

Internet financing refers to a new type of financial business model in which all entities in the financing chain use Internet technology and information and communication technologies to realize financial financing, payment, investment and information intermediary services. Internet financing is an important part of Internet finance. It is the main application of Internet finance in the capital demand market. The Internet financing model has the following three core components: First, the payment method, that is, based on mobile payment, cash, securities, etc. The payment and transfer of financial assets are carried out through the Internet. The computerization of payment clearing replaces the circulation of cash. Second, information processing, that is, under the condition of cloud computing, the information of the financing demand side and the capital flow exporting body through the network platform, Being informed by the public, it can provide relatively accurate risk pricing and dynamic default probability for lenders, and the cost is low. Third, resource allocation, that is, capital supply and demand information is published online, both parties can directly contact and trade. There are transparent and fair trading opportunities, and the use of Internet finance can achieve regional efficiency and resource allocation. The main elements of Internet financing include financing demand side, financing platform, effective guarantee party, and the entity who provide cash flow. Internet finance uses a contract or contractual approach to control the flow between different nodes in the entire financing chain. The credit support and settlement system used in the financing platform provides an overall financial support model for the financing chain. In the actual situation, an important reason why the entity who provide cash flow is not willing to provide the financing demand side cash is to avoid credit risk. The main reason for the credit risk is that the internal control ability of some of the less powerful financing demand parties is insufficient. Due to the lack of guarantee capability, in the Internet financing, the entity who provide cash flow is more concerned about the credit rating of the entire financing chain, and the accounts receivable have more practical value and liquidity because of effective guarantee. In the entire Internet financing model, what factors affect the willingness of the entity who provide cash flow to provide funds, and what factors affect the guarantor's support for other financing chains, and how these factors affect the stakeholders. Based on the above questions, this paper uses the Starbuck model, a dual-headed model with "dominant" and "subordinate" relationships to model, mainly to study the main interests of the dominant party's capital flow in the Internet financing model and the guarantor of the affiliation, and how to establish a reasonable pricing and proper sharing to achieve the maximum benefit of the entire financing chain.

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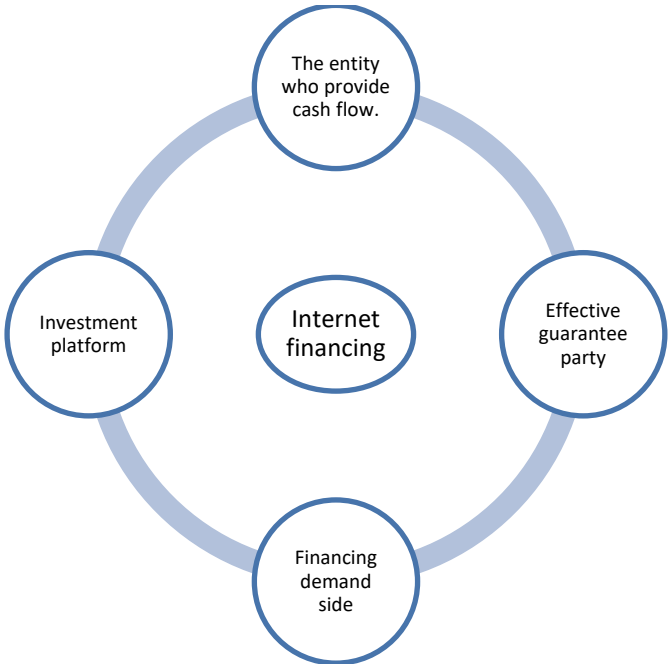

Fig.1 The relationship chart of the factors of internet financing

2. Internet financing model process

The Internet financing model process can be expressed as: the entity who provide cash flow and the financing demand side, the effective guarantee party signing the internet financing service contract; the financing demand side pledges the accounts receivable to the entity who provide cash flow and applies for the discounted short-term loan; After verification, the application provides short-term loans to the financing demand side; after the effective guarantee party pays a certain deposit, the entity who provide cash flow provides loans to the financing demand side, and the financing demand side makes the financing demand side wholly or staged. Obtain funds; the financing demand side obtains funds, and pays a certain amount of service fees to the entity who provide cash flow; the effective guarantee party directly delivers the accounts receivable amount to the entity who provide cash flow, and pays a certain amount of services to the entity who provide cash flow. After the operation process is simplified, a financing income game model can be established. The entity who provide cash flow collects the service fee from the effective guarantor according to the predetermined unit price and the discounted amount of the accounts receivable. Since the effective guarantor is in a weak position in this game, they are the recipient of the service fee price. They have to maximize their own earnings by adjusting the service rate and the discount on the goods or services of the financing demand side.

3. Assumptions and model indicators for setting up the model

The assumption for setting up the model is: when the supply chain composed of the financing demander and the effective guarantor applies for financing from the entity who provide cash flow, the entity who provide cash flow first provides the discounted amount of the accounts receivable according to the agreed discount rate; The entity provides discounts to the supply chain without economic profit, so a certain percentage of the service fee is charged when the discount is provided; the service fee is jointly borne by the financing demander and the effective guarantor, and the discount provided by the financing demander directly affects the effective guarantee. The party is willing to bear the proportion of service fees. The parameters that need to be used in the pricing model are as follows: P indicates the quotation of the discounted short-term loan service (yuan/unit financing amount) for the entity who provide cash flow to provide the pledge of the accounts receivable; F(P) indicates the unit financing amount. The service price is the total amount of

financing required by the financing demander and the effective guarantor (unit financing amount/year), because F(P) is a demand function, so according to the characteristics of the demand function, it should be a P and F(P) is presented; the function of the relationship in the opposite direction is assumed to be $F(P)=aP^{-b}$, (a>0, b>1), a is the conversion constant, and b is the price elasticity R_B indicating the discount of accounts receivable rate; D indicates the proportion of the deposit paid by the effective guarantor, that is, the amount of the deposit paid as a percentage of the total financing amount; C_B indicates the capital flow to the main financing unit cost (yuan/unit financing amount); R_D indicates the goods provided by the financing demander Discount rate; a_1 indicates the proportion of service fees borne by the effective guarantor; a_2 indicates the proportion of service fees borne by the financing demand side; P_S indicates the repayment default rate; U_B indicates the net income of the main body of the capital flow (yuan); U_C indicates the effective guarantor Net income (yuan).

4. The model of the entity who provide cash flow gain profits from financing

In the Internet financing model pricing model, the net income of the entity who provide cash flow in this item can be expressed as:

U_B=Providing financing service benefits - financing failure risk - operating costs.

The difference in the discounted amount of accounts receivable can be reduced to the total amount of accounts receivable multiplied by the discount rate, that is, the discounted income of accounts receivable = R_BF (P). The income from the service fee shall be the quoted price of the discounted short-term loan service that provides the pledge of the receivables by the single fund flow exporting multiplied by the total amount of the accounts receivable, that is, the service fee = PF (P). Therefore, the financing service income = the receivables discounted differential income + service fee = R_BF (P) + PF (P); the financing failure risk is the capital flow export subject in the financing operation process, for some reason, after the breach of contract The amount of assets to be lost, namely: financing failure risk = F(p)(1-D)Ps; operating cost is the related expenses that the capital flow exporting entity needs to spend when providing financing to the financing demand side, the amount and the receivable The demand for accounts services is directly proportional, namely: operating cost = CBF(p); therefore, the net income of the capital flow exporting entity can be expressed as:

$$U_B = R_BF(P) + PF(P) - F(P)(1-D)P_S - C_BF(P) = \left[R_B + P(1-D)P_S - C_B\right]aP^{-b} \quad (1)$$

In order to ensure that the capital flow derives the maximum value of the main income, the first-order derivative and the second-order derivative of the decision variable P of the above formula need to be respectively obtained, because if there is a reasonable maximum value for the net income of the capital flow derived subject, the following conditions are met: U_B is a concave function; the net income of the subject of the capital flow is greater than zero.

Therefore, the decision variable P should satisfy the following range:

$$(1-D)P_S + C_B - R_B < P < \frac{b+1}{b-1}\left[R_B + P - (1-D)P_B - C_B\right] \quad (2)$$

$$\text{Make } \frac{dU_B}{dp} = 0, \text{ then: } P = \frac{b}{b-1}\left[R_B - (1-D)P_S - C_B\right] \quad (3)$$

When P satisfies the value interval requirement of formula (2), the net return of the entity who provide cash flow at this time is maximized and greater than zero. It can be seen that the income from the entity who provide cash flow is subject to price elasticity b, the flow rate of the funds is exported to the main body discount rate R_B, the deposit ratio D paid by the effective guarantee party, the repayment default rate PS, and the capital flow is derived from the main financing unit cost C_B. When the pricing P satisfies the formula (3), the capital flow derivation subject can obtain the largest net benefit. Because of the price elasticity, the capital flow is exported to the main body discount rate, and the proportion of the deposit paid by the effective guarantee party is fixed. Therefore, the main factors of change are the repayment default rate and the capital flow to the main

financing unit cost. The default rate of repayment is mainly determined by the stability of the effective guarantor and the credit rating of the supply chain. Therefore, the entity who provide cash flow will accept those supply chain financing applications with relatively stable supply chains. The financing cost of the entity who provide cash flow is generally determined by the way of the creation and management of the information system platform from which the capital flow is derived. the entity who provide cash flow should strengthen management, simplify the procedure, and improve the construction of the information operation platform.

5. The model of the effective guarantor gain profits from financing

In the financial model of Internet financing, the benefits of a valid guarantor can be expressed as:

U_C = discount on goods or services obtained - financing service fees paid - risk of financing failure.

Among them: the discount of the goods obtained is the guarantee according to the agreed contract, and the guarantee party provides a certain amount of goods or services discount to the effective guarantee party when the guarantee party makes a certain deposit for the accounts receivable. The discount on goods or services obtained = $R_D F(p)$; the financing service fee paid is the part of the overall financing activities of the supply chain, and the service fee charged by the entity who provide cash flow should be paid by the effective guarantee party, because the financing demander bears The service fee and the total amount of the service fee borne by the effective guarantor are the total amount of the service fee receivable from the main body of the capital flow, that is, $a_1+a_2=1$, so the financing service fee to be paid by the effective guarantor here=$a_1 PF(P)$ The risk of financing failure is that when the entity who provide cash flow provides financing to financing demand side, the effective guarantee will transfer the funds to the main body to pay the deposit. The loss caused by some default, that is, the financing failure risk = F(p)DPs.The benefits of a valid guarantor are:

$$U_C = R_D F(P) - a_1 PF(P) - F(P)DP_S = (R_D - a_1 P - DP_S)aP^{-b} \quad (4)$$

Because at this time, the quotation P of the discounted short-term loan service that provides the pledge of the accounts receivable is known, and because the service fee PF(P) charged by the entity who provide cash flow is the percentage paid by the financing demand side, $a_1 PF$ (P) and the sum of $a_2 PF(P)$ paid by the valid guarantor, and $a_1+a_2=1$, because the total amount of accounts receivable is certain, so the distribution of the specific single service fee is based on the flow of funds. The single service fee is $a_1 P$ and $a_2 P$, respectively, so P and (a_1+a_2) are substituted, and then the first derivative and the second derivative are obtained for the decision variable a_1, respectively, because if the effective guarantor's income has a reasonable maximum, The following conditions need to be met: U_C is a concave function; the net benefit of a valid guarantor is greater than zero.

The range that can be obtained by the decision variable a_1 is:

$$\frac{b(b+1)(R_D-DP_B)+2(b-1)^M}{h(h-1)M} < a_1 < \frac{1}{M+R_B}(R_D - DP_B) \quad (5)$$

Among them: $M = \frac{b}{b-1}[R_B - (1-D)P_B - C_B]$,

$$\text{make } \frac{dU_C}{d\varepsilon} = 0, \text{then}, a_3 = \frac{b(R_D-DP_B)+M}{M(h-1)} \quad (6)$$

At this point, the net benefit of the effective guarantor is maximized and greater than zero. At this time, the entity who provide cash flow obtains the quotation P of the discounted short-term loan service for the pledge of the accounts receivable from the fund flow exporting entity when the income is maximized according to its own situation, and the effective guarantor determined by the effective guarantor at this time bears The service fee ratio a_1 is related to the pricing P of the capital flow derivation subject and the commodity discount rate R_D provided by the Financing demand side. When a_1 satisfies formula (6), the effective guarantor can obtain the maximum net income. It can be

seen that the higher the discount rate R_D offered by the financing demand side ,the more the service guaranty ratio a_1 that the effective guarantor is willing to bear. The higher the proportion D of the deposit paid by the effective guarantor, the lower the proportion of service fees a1 that the effective guarantor is willing to bear.

6. Analysis of total revenue of financing platform

Through the financial model of financing the Internet, the analysis of the income of the entity who provide cash flow and the effective guarantor can be used in the financing process of the two parties' respective optimal strategies, and at this time, the conditions for maximizing the mutual benefits are simultaneously satisfying P and a_1 , so the total income expression of the financing system is substituted, and the total income of the financing system can be expressed as:

U= The income of the entity who provide cash flow + The income of effective Guarantor

$$=U_B+U_C=\left[R_B-C_B-DP_S-(1-D)P_S+R_D+(1-a_1)P\right]aP^{-b} \quad (7)$$

It can be known from formula (7) that in the internet financing model, when the the entity who provide cash flow and the effective guarantee party reach the Starbuck game equilibrium, when the total profit of the financing platform is the largest, the entity who provide cash flow should provide the accounts receivable pledge. The quotation P of the discounted short-term loan service satisfies the formula (3) and satisfies the formula (6) that the effective guarantor is willing to bear the service fee. The total return of the financing platform at this time is the largest, and the demand for financing services, the characteristic conversion constant, the price elasticity, the discount rate of the main body of the capital flow, the discount provided by the small and medium-sized enterprise, and the operating unit cost of the main body of the capital flow are related to the repayment default rate.

7. Conclusion

To sum up, to improve the profitability of the entire financing platform, the main focus of the entity who provide cash flow is the repayment default rate, the financing unit cost of the main body of the financing flow and the discount provided by the financing demand side. From the perspective of the entity who provide cash flow, to reduce the default rate of repayment, on the one hand, we must select high-quality supply chain customers, on the other hand, we must strengthen the monitoring and post-loan management of the supply chain. The financing cost of the entity who provide cash flow is mainly related to the sum of manpower and material resources consumed in the whole financing operation. Therefore, it is necessary to strengthen the creation of the information system platform for the main body of capital flow and use a more efficient management method. The discount of the financing demand side is related to the ratio of the service fee borne by the effective guarantor. The higher the discount rate of the goods provided by the financing demand side, the higher the proportion of the service fee that the effective guarantor is willing to bear. In the 21st century, enterprise competition is the competition between supply chains. Therefore, supply chain management should also become a matter of concern for effective guarantors. Only the stability of the entire supply chain and the improvement of liquidity of funds can make the benefits of effective guarantors have been fundamentally improved.

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