

# Research on the Influence of Internet Finance on Household Financial Asset Allocation Based on Analytic Hierarchy Process

Chen Chen

School of Finance, Anhui University of Finance and Economics, Anhui, 233030, China

## Abstract

With the development of the Internet and cloud computing and big data in recent years, various new industries combined with the Internet have also followed, and Internet finance among them has achieved blowout growth. With the rapid development of the domestic economy, the disposable income of residents continues to increase. People are no longer satisfied with depositing money in banks for fixed interest, but instead shift their goals to broader financial markets to pursue higher profits and accumulate more. Family wealth. In contrast, the current service gaps in the traditional financial industry are not enough to meet the increasing needs of household finance, and Internet finance with low thresholds, strong liquidity, and high profitability is welcomed by more and more households. As a new business model, Internet finance is bound to have an impact on the allocation of household financial assets. The article uses the analytic hierarchy process to comprehensively evaluate the impact of Internet finance on the allocation of household financial assets, and gives specific countermeasures and suggestions from both households and Internet financial enterprises.

## Keywords

Internet finance; household asset allocation; analytic hierarchy process.

## 1. Introduction

The innovation of science and technology promotes social development. Loan products such as Ant Huabei, JD Baitiao, JD Finance, Yu'e Bao wealth management products and other Internet financial products have enriched the connotation of financial products and are welcomed by more and more families. At the same time, the traditional financial industry's financial product innovation is insufficient and the structure is single, and it is impossible to achieve the optimal matching of household assets and financial products. Traditional finance is far less attractive to household finance than Internet finance. When Internet finance was on the rise, the demise of p2p online lending and the suspension of Ant Financial Services also attracted widespread attention from the financial community, residents and scholars. It can be seen that the rise and crisis of Internet finance is a hot spot in society and plays a pivotal role in the financial market. On the other hand, household finance is also an indispensable and important unit of the financial market. The rise and fall of the financial model has affected household finance not only in the field of social life, but also in the academic field. Therefore, this article uses the analytic hierarchy process to analyze the changes that household financial asset allocation will make to the transition from the traditional financial model to the Internet financial model, which is helpful to understand the market participation of household finance and optimize the investment portfolio, and promote the innovation of financial institutions.

## 2. Literature review

Related research on the influencing factors of household financial asset allocation

At present, there has been a lot of literature on the influencing factors of household financial asset allocation, and the content is full and accurate.

Most of these scholars choose to conduct a more complete theoretical analysis and empirical analysis on the internal influencing factors of a certain family. At the level of demographic characteristics, the age structure of the population has been proved to have an important impact on household asset allocation decisions and risk decision-making behaviors. The increase in the number of elderly populations in various family structures will lead to a decline in the proportion of family risk investment and the overall investment depth, but still There are many differences (Lu Yajuan et al., 2018); residents' well-being is positively correlated with family savings, insurance, donations and other investment expenditures, while participation in investment activities with a higher degree of risk is low (Ye Dezhu et al., 2014); those with good health Families tend to have a higher risk ratio of financial assets (Hu Zhen et al., 2015).

Scholars have analyzed the mechanism of influence on household financial asset allocation from the perspective of macroeconomic policy. Pension insurance promotes the allocation of risky financial assets of urban households (Zhang Qiuyue, 2020); the increase in the level of social medical insurance will enable households to transfer safe assets to risky assets, changing the structure of household financial asset allocation (Wang Wen et al., 2020) The instability of policies will cause households to reduce the proportion of risky assets for preventive motives and reduce the probability of households participating in the financial market (Liu Fengyu et al., 2019).

In addition, some scholars use geographic regions as the basis for dividing household financial asset allocation. Liu Jie (2020) chose the top three GDP ranking countries, the United States, China and Japan, to analyze the characteristics of household financial asset allocation and compare them; Li Kai (2019) Through a horizontal comparison of urban households and rural households, it is found that assets are unevenly distributed, and urban and rural areas also have similar or very different characteristics.

Research on the innovation and development of Internet finance

Compared with the traditional financial industry, the innovation of Internet finance is to make up for the shortcomings of the traditional financial industry by using the advantages of the Internet that cannot be replicated. Hu Yani (2014) analyzed the shortcomings of traditional finance from the perspective of banking business, and discussed the impact of Internet finance on traditional commercial banks. Cao Fengqi (2015) concluded that Internet finance is an innovation in financial models, financial concepts, and financial operations. However, everything has two sides, and there are risks and crises in the development of Internet finance. Xu Ming (2020) concluded that Internet financial products are gradually showing that the credit reporting system is not sound, financial products are gradually converging, infrastructure and regulatory systems Issues such as imperfections.

By sorting out previous scholars' literature on Internet finance and household financial asset allocation, I found that there are relatively few empirical studies on household financial asset allocation using Internet finance as an entry point. This article will first use the theoretical knowledge learned to deduce the influence mechanism of Internet finance on household finance according to the mainstream trend of society. Then, using the analytic hierarchy process to conduct an empirical analysis of the impact of Internet finance on household asset allocation, study the domestic household asset allocation and analyze the influencing factors of sample data. Finally, it summarizes the aspects of the influence of Internet finance on household finance, and puts forward opinions on the follow-up development.

### 3. Theoretical analysis

#### (1) Network effect theory

In people's daily life, food, clothing, housing, and transportation are inseparable from the Internet. The increasingly popular information products have such characteristics: consumers who use products or services of this nature form a network, and when other consumers buy such products or Service, when you join this network, you will get extra value. Economists call products with such characteristics as network products, and markets with such characteristics as network markets. The value spillover effect generated by consumer behavior is called network externality (demand-side economies of scale). The family is composed of people of different ages and different consumption concepts, and the allocation of family assets is the development and extension of the allocation of personal assets.

#### Long tail theory

In the traditional financial industry, the "28th law" has always been the basic norm followed by the financial industry. The so-called "28th law" means that 80% of society's wealth is concentrated in the hands of 20% of the people. The traditional financial industry classifies a large number of financial micro-units with scattered funds into 80% of the group. Due to the limitations of traditional finance, the cost of pursuing individualized needs is too high and difficult to achieve, so it ignores The development of this "big group" financial market focuses on the "small group, big subject" part of the market. As the long-tail theory has entered people's vision as a supplement to the "28th Law", the existence of Internet finance is like icing on the cake. The emerging Internet finance industry has led the financial industry to shift its perspective to the "tail" of the financial market, using the Internet The personalized services and low-cost advantages of the company have greatly improved the position of micro-subjects, including household finance, in the market, broadened the scope of household finance activities, and enhanced the activity of household finance in the market.

#### Financial intermediary theory

Financial intermediary theory is mainly based on the transaction cost theory in institutional economics and the information asymmetry theory in information economics. The financial intermediary theory explains the reasons for the existence and development of financial institutions. With the development of the Internet and big data, Internet finance has more advantages than traditional intermediaries in reducing transaction costs and information asymmetry. Internet finance has broken through the limitations of time and space, eliminating complicated procedures and costs. Compared with traditional financial intermediary methods, the transaction information that can be obtained independently is more convenient and rich, and the marginal cost of obtaining information is close to zero. Through Internet communication, financial products have greater adaptability and can better meet the individual needs of people, thereby reducing the participation cost of investors.

#### Life cycle theory

The family life cycle theory in the life cycle theory provides a useful framework for people to foresee the development stages that the family will go through, such as: uniting the family through marriage, giving birth to children, and the elderly being late. Provides a vision of where family problems have occurred in the past, are trying to deal with tasks now, and where they are going in the future. This is a more positive perspective that focuses on family abilities. It is believed that while the family can maintain stability and continuity, it can improve and change its structure in order to maximize the benefits and utility of the entire family's life cycle. As a result, the choice and combination of financial products and services must be diversified and individualized. Internet finance can better meet the needs of households for the choice of financial products than traditional finance.

In summary, the rise of Internet finance is bound to affect household financial asset allocation.

### 4. Construction of the evaluation system

In order to better select the factors affecting the allocation of household assets by Internet finance, this paper, based on the research results of domestic and foreign scholars and selected indicators, is based on the principles of systemic, scientific, and purposeful, fixed asset ownership ( C1), average annual income (C2), proportion of medium and high risk assets (C3), education level (C4), investment years (C5), risk appetite (C6), age distribution (C7), risk perception of financial products (C8) ), risk and return knowledge (C9), asset allocation knowledge (C10) 10 influencing factors, and divide them into household asset size (B1), personal characteristics (B2), financial knowledge reserve (B3).

Table 1 Evaluation index system

Target layer	Criterion layer	Scheme layer
The Impact of Internet Finance on Household Asset Allocation(A1)	Household asset size(B1)	Fixed asset ownership(C1)
		Average annual income(C2)
		Proportion of medium and high risk assets(C3)
	characteristic(B2)	Education level(C4)
		Investment years(C5)
		Risk appetite(C6)
		age distribution(C7)
	Financial knowledge reserve(B3)	Financial product risk perception(C8)
		Risk and return knowledge(C9)
		Asset Allocation Knowledge Cognition(C10)

### 5. Empirical analysis

Constructing a comparison judgment matrix

The analytic hierarchy process decomposes complex issues related to decision-making into target level, criterion level, program level and other levels and several influencing factors. Through pairwise comparison and scoring of different factors, a judgment matrix is established to reveal the weight of each indicator. It is a combination of qualitative and quantitative methods, and is widely used in multi-objective, multi-criteria system evaluation.

This article establishes the judgment matrix through expert scoring method. That is, let the experts compare and judge each influencing factor in pairs, and score from one to nine according to the importance of each two factors (where 1 means that two factors are equally important, and 9 means that one factor is very important to the other. Important, the larger the number, the greater the importance of one factor relative to another), so as to measure the weight of each indicator.

The eigenvector  $W_i$  of each matrix is calculated by MATLAB software, and the consistency test is performed. Among them, the judgment matrix A-B between the target layer and the criterion layer is shown in Table 2, and the judgment matrix B-C between the criterion layer and the plan layer is shown in Table 3-5.

Table 2: Judgment matrix A-B

A1	B1	B2	B3
B1	1	1/2	2

B2	2	1	4
B3	1/2	1/4	1
$\lambda_{max}=3, CR= 0 < 0.1$ , pass the consistency check			

Table 3: Judgment matrix B1-C

B1	C1	C2	C3
C1	1	2	5
C2	1/2	1	3
C3	1/5	1/3	1
$\lambda_{max}=3, CR= 0.0036 < 0.1$ , pass the consistency check			

Table 4: Judgment matrix B2-C

B2	C4	C5	C6	C7
C4	1	1/2	1	1/3
C5	2	1	2	1/2
C6	1	1/2	1	1/4
C7	3	2	4	1
$\lambda_{max}=4, CR= 0.0039 < 0.1$ , pass the consistency check				

Table 5: Judgment matrix B3-C

B3	C8	C9	C10
C8	1	1/3	1
C9	3	1	3
C10	1	1/3	1
$\lambda_{max}=3, CR= 0 < 0.1$ , pass the consistency check			

(2) Hierarchical ranking and consistency test

Consistency test is a necessary step of analytic hierarchy process. He is the standard for testing the rationality of the matrix. If the matrix does not pass the consistency test, then the weights obtained will be wrong, and there is no convincing power.

First, check the consistency of all the matrices to get the consistency index:

$$CI = \frac{\lambda_{max} - n}{n - 1} \tag{1}$$

n is the order of the matrix, and  $\lambda_{max}$  is the maximum eigenvalue of the matrix. We then calculate the consistency ratio of the matrix by formula (2):

$$CR = \frac{CI}{RI} \tag{2}$$

The value of RI is shown in the following table. When CR is less than 0.1, the matrix is considered reasonable and passes the test. When CR is greater than 0.1, the matrix is considered unreasonable and cannot pass the test.

Table 6 : Standard values of average random consistency index RI

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.52	0.89	1.12	1.26	1.36	1.41	1.46	1.49

Using MATLAB to calculate the weight vector of each judgment matrix and conduct a consistency test on them, the results show that the consistency ratios of the six matrices are all less than 0.1, which passes the consistency test.

Use MATLAB to calculate the combination weight of the scheme layer to the target layer, and sort them. The weights of the 10 indicators are: fixed asset ownership (0.1662), average annual income (0.0883), proportion of medium and high risk assets (0.0313), education Level (0.1057), investment years (0.1972), risk preference (0.0570), age distribution (0.2115), financial product risk perception (0.0286), risk return knowledge (0.0857), asset allocation knowledge (0.0286).

Table 7 The weight of each indicator

Criterion layer		Scheme layer		Analytic hierarchy process weight
index	weight	index	weight	weight
Household asset size (B1)	0.2857	Fixed asset ownership (C1)	0.5816	0.1662
		Average annual income (C2)	0.3090	0.0883
		Proportion of medium and high risk assets (C3)	0.1095	0.0313
characteristic (B2)	0.5714	Education level (C4)	0.1850	0.1057
		Investment years (C5)	0.3452	0.1972
		Risk appetite (C6)	0.0997	0.0570
		age distribution (C7)	0.3701	0.2115
Financial knowledge reserve (B3)	0.1429	Financial product risk perception (C8)	0.2	0.0286
		Risk and return knowledge (C9)	0.6	0.0857
		Asset Allocation Knowledge Cognition (C10)	0.2	0.0286

Result analysis

- ① The CR values of the above judgment matrices are all less than 0.1, indicating that the judgment matrices all pass the consistency test.
- ② From the perspective of the feature vector of the criterion layer to the target layer, the personal trait factor has the largest weight, followed by the family asset scale, while the financial knowledge reserve factor has the smallest weight, indicating that the Internet finance evaluation of household asset allocation includes education level Personal characteristics, including characteristics such as age and age, are the first factors to be considered. The amount of financial knowledge reserves has a relatively small impact on household asset allocation.

③From the perspective of the weight of the plan layer to the target layer, the weight of the age distribution is the largest, which is completely consistent with the weight ranking of the plan layer. This may be because groups of different age groups have large differences in asset scale, risk appetite, and investment life. Therefore, in terms of asset allocation, they are more susceptible to the influence of Internet finance.

## 6. Conclusions and recommendations

Based on the results of the above empirical analysis, from the perspective of promoting the sustainable and healthy development of Internet finance and improving household asset allocation, the author gives policy recommendations from two aspects: households and Internet finance companies.

From the family level, family members, especially the head of the household, need to continuously learn and accept new financial knowledge, reduce personal irrational behaviors, and increase investment awareness and risk awareness; at the same time, they must be brave to try to allocate different assets to reduce the concentration of family assets. Disperse risks and improve the family's ability to resist risks.

For Internet financial companies, they must first strengthen their own construction to ensure that the Internet platform operates reasonably and openly within the scope permitted by law; then build the company's information technology defense system, improve information security capabilities, and create an open, transparent, and safe operating environment; Finally, do market due diligence and provide differentiated products and services to meet family financial needs while increasing customer stickiness.

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