Research on Growth Evaluation of Fintech Listed Companies based on Factor Analysis

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Abstract

As the latest development achievement in the financial field, fintech enables finance by means of science and technology, and makes the depth of science and technology and finance closely combined, which plays a key role in serving the real economy and promoting inclusive finance. Evaluating and studying the growth of fintech listed companies can better understand their development status, which plays an important role for the government, society and investors. Based on the SPSS software factor analysis method, this paper takes all 39 listed companies in the fintech sector as samples, studies and evaluates the development status of listed companies in the field of fintech by establishing a company development evaluation system with 12 indicators in four aspects of operating capacity, development capacity, profitability and solvency. The empirical analysis results show that the development of listed enterprises in China's fintech field is relatively general, and there is a large space for growth. Relevant enterprises need to strengthen scientific and technological research and development, pay attention to brand building, so as to strengthen the core competitiveness and achieve high growth.

Keywords

Fintech; Factor Analysis; Growth; Evaluation Study.

1. Research Background

In recent years, fintech has attracted people's continuous attention and become another outlet of the financial industry after Internet Finance. Fintech, developed from Internet finance, is an advanced form of Internet Finance and the latest development achievement in the financial field. Fintech enables finance through scientific and technological means, which makes technology and finance closely combined, improves operation efficiency, reduces operating costs, provides better products and services for customers, and changes the business form and mode of traditional financial field. Fintech plays an important role in improving financial risk management , promoting Inclusive Finance and serving the real economy, providing strong impetus for the reform of the financial industry.

In March 2014, fintech appeared in the government work report for the first time; In August 2019, the People's Bank of China issued the development plan of fintech for the next three years, raising fintech to an unprecedented height; In December 2019, the People's Bank of China launched the pilot of fintech supervision and launched the Chinese version of supervision mode. At present, China has become one of the most advanced countries and regions in the field of financial science and technology. Therefore, it is of great significance to evaluate and study the growth of listed companies in the field of fintech. It can provide reference for the government, society, and the majority of investors. It can also provide help for fintech companies to find their own advantages and disadvantages, and make clear the direction for future development.

At present, the academic research on the growth of listed companies is more extensive, involving various industries. As far as the financial field is concerned, there are many studies on the growth of listed banks and securities companies, but there are few studies on the development of listed companies in the field of fintech. At present, fintech is in its infancy, the development pattern of the industry has not been finalized, and the growth characteristics of enterprises are constantly changing. Evaluating and studying the growth of fintech listed companies is the continuation and supplement of similar research.

2. Research Design

2.1. Sample Selection and Data Sources

In order to show the actual situation of the development of the listed companies in the fintech field, this article selected all the listed companies whose index of the fintech industry (930986) on the end of the Hithink RoyalFlush Information Network Co., Ltd "ifind" financial data by the end of 2020 as the sample. Considering the representative of the sample selection and the acquirement of the data source, they finally chose the 39 listed companies as the samples, including East Money Information Co., Ltd (300059.SZ), JC Finance&Tax Interconnect Holdings Ltd (002530.SZ), Hithink RoyalFlush Information Network Co., Ltd (300033. SZ) and Shanghai Great Wisdom Co., Ltd (601519.SH). The information disclosed in the annual financial report of the company in 2020 is selected as the data, and the statistical calculation and empirical analysis are carried out by using the factor analysis method of SPSS software.

2.2. Establishment of Evaluation Index System

In order to evaluate and study the growth of fintech listed companies, this paper establishes an evaluation system of the company's development status referring to the common practice of previous scholars, including four levels of operating capacity, development capacity, profitability and solvency with a total of 12 indicators, as shown in Figure 1. The selection of these indicators is in line with the concept of easy access and simple operation, and can better reflect the growth and characteristics of fintech listed companies.
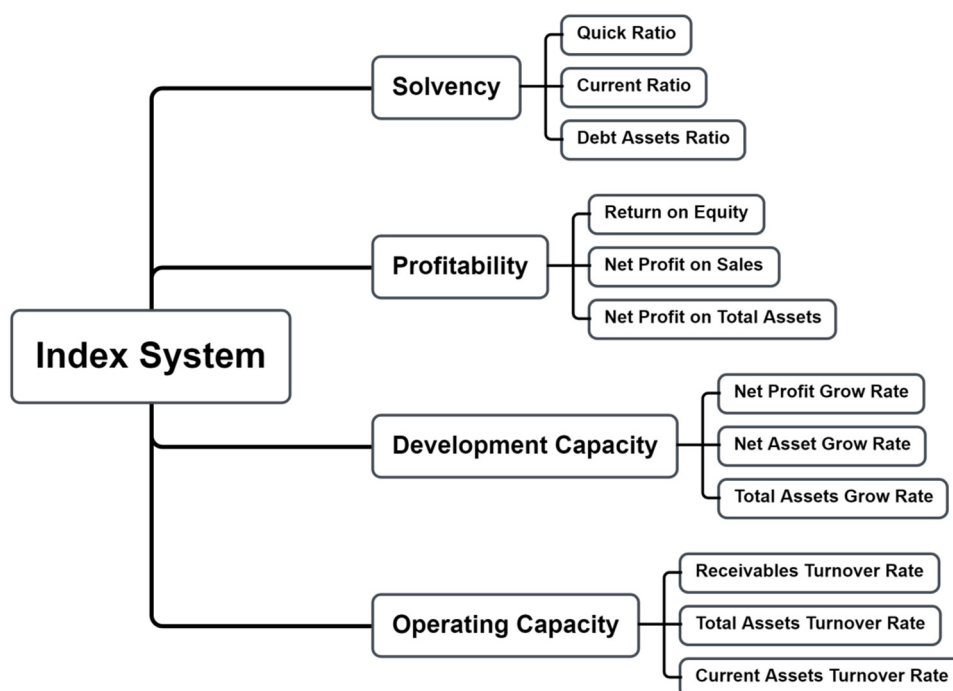

Figure 1. Index System

3. Empirical Analysis

3.1. Data Standardization

3.1.1. Forward Data Processing

According to the different meanings of indicators, evaluation indicators can be divided into positive, moderate and reverse indicators. For positive indicators, the higher the value is, the better the operation and development of the company is; For the moderate index, if the value is in a certain range, it means that the company's business development is good. If the value is too large or too small, it means that the company's business development is not good; For the reverse indicator, the lower the value is, the better the company's operation and development is. Among the twelve indicators selected in this paper, the moderate indicators are the three indicators (quick ratio, current ratio and asset liability ratio) indicating solvency, and the remaining nine are positive indicators. However, only positive data can be analyzed in factor analysis. Therefore, the three moderate indicators of solvency should be converted from moderate indicators to positive indicators. The formula of normalization is:

$$Y_i = \frac{1}{|X_i - k| + 1}$$

Where Y_i is the index value after normalization; X_i is the index value before normalization; K is the standardization coefficient of the index. Referring to the industry standard and the common practice of previous scholars, this paper gives the standardized coefficient of current ratio as 2, the standardized coefficient of quick ratio as 1, and the standardized coefficient of asset liability ratio as 0.5.

3.1.2. Dimensionless Data Processing

The selected indicators have different representation units and data dimensions, and the comparability between indicators is low. If factor analysis is carried out by substituting the initial data, the results may have a large deviation from the real situation. In order to reduce the deviation of results caused by different data dimensions and enhance the comparability between indicators, the initial value should be dimensionless. Referring to the common practice of previous scholars, this paper uses Z-Score method for data standardization, changing all initial values into values with variance and mean value of 1. The standardized formula is:

$$Z = \frac{Y - \overline{Y}}{S_y}$$

Where Z is the standardized variable value; Y is the variable value before standardization; $\overline{Y}$ represents the mean value of the variable; S_y is the standard deviation of the variable.

3.2. Data Test

3.2.1. KMO and Bartlett Sphericity Test

Before factor analysis, we need to test the correlation between variables to verify whether it is suitable for factor analysis. Therefore, KMO test and Bartlett sphericity test should be carried out on the selected 12 evaluation indexes of four evaluation levels of listed companies.

The test results show that the KMO measure of the data is 0.666, greater than 0.5; The approximate chi square value of Bartlett sphericity test was 458.456, and the significance level was 0.000, less than 0.05. The test results are significant, so it is considered that the selected evaluation indexes can be used for factor analysis.

Table 1. KMO and Bartlett Test

KMO Sampling Suitability Quantity		0.666
Bartlett Sphericity Test	Approximate Chi Square	458.456
	Freedom	66
	Significance	0.000

3.2.2. Variable Commonality Detection

Using factor analysis to test the common degree of variables, we can see that the extraction degree of the selected 12 evaluation indexes is all greater than 0.6, most of them are close to or greater than 0.9. The results show that the selected common factors can better map most of the initial variables, and the effect of factor analysis is better.

Table 2. Common Factor Variance

	Initial	Extracted
X_1 Net Profit on Total Assets	1.000	0.925
X_2 Return on Equity	1.000	0.934
X_3 Net Profit on Sales	1.000	0.766
X_4 Current Ratio	1.000	0.820
X_5 Quick Ratio	1.000	0.811
X_6 Debt Assets Ratio	1.000	0.867
X_7 Current Assets Turnover Rate	1.000	0.976
X_8 Receivables Turnover Rate	1.000	0.837
X_9 Total Assets Turnover Rate	1.000	0.968
X_{10} Net Asset Grow Rate	1.000	0.876
X_{11} Net Profit Grow Rate	1.000	0.648
X_{12} Total Assets Grow Rate	1.000	0.694

3.3. Empirical Analysis

3.3.1. Factor Extraction

The results show that the eigenvalues of the first four common factors are greater than 1, and the total variance is 84.354%, which shows that the first four common factors can reflect the development of Listed Companies in the field of fintech, so the first four components are selected as the common factors.

3.3.2. Factor Rotation

In this paper, we use Caesar's method of normalizing the maximum variance to rotate the factors. After five iterations, we get the list of rotated component matrices as shown in the following table. It can be seen from the data in the table that the factor load coefficient after rotation has obvious differentiation. The first common factor has a larger load on the indicators X_1 , X_2 and X_3, which reflect the company's profitability. The common factor F_1 is named profitability factor; The second common factor has a larger load on the indexes X_4, X_5 and X_6, these three variables reflect the company's ability to repay its debts. Therefore, the common factor F_2 is named as the solvency factor; The third common factor has a larger load on the indicators X_7, X_8 and X_9, which reflect the company's operation ability, so the common factor F_3 is named as the operation ability factor; The fourth common factor has a large load on

the indicators X_{10}, X_{11} and X_{12}, these three variables reflect the company's sustainable growth ability. Therefore, the common factor F_4 is named as the development ability factor.

Table 3. Explanation of Total Variance

Component	Initial Eigenvalue			Component	Extract the Load Sum of Squares		
	Total	Variance%	Accumulate%		Total	Variance%	Accumulate%
1	4.417	36.812	36.812	1	4.417	36.812	36.812
2	2.815	23.456	60.268	2	2.815	23.456	60.268
3	1.852	15.430	75.697	3	1.852	15.430	75.697
4	1.039	8.657	84.354	4	1.039	8.657	84.354
5	0.600	5.001	89.354				
6	0.454	3.780	93.134				
7	0.307	2.559	95.693	Component	Sum of Squares of Rotational Loads		
8	0.207	1.726	97.420		Total	Variance%	Accumulate%
9	0.157	1.308	98.728	1	4.143	34.523	34.523
10	0.122	1.015	99.743	2	2.551	21.259	55.782
11	0.026	0.217	99.960	3	2.151	17.926	73.708
12	0.005	0.040	100.000	4	1.278	10.646	84.354

Table 4. Composition Matrix After Rotation

	Component			
	1	2	3	4
X_1	0.905	-0.192	0.242	0.106
X_2	0.934	-0.088	0.216	0.079
X_3	0.921	-0.075	-0.280	0.093
X_4	-0.203	0.875	0.118	0.011
X_5	0.008	0.888	-0.043	-0.144
X_6	-0.055	-0.906	-0.195	-0.065
X_7	0.044	0.170	0.970	-0.071
X_8	0.169	-0.084	-0.971	0.092
X_9	0.116	0.063	0.975	-0.011
X_{10}	0.309	0.033	0.086	0.462
X_{11}	0.129	-0.066	0.088	-0.523
X_{12}	0.206	0.284	-0.052	0.528

3.3.3. Factor Score

The coefficient matrix of component score calculated by regression analysis is shown in the table below. According to the coefficients in the table, the expression of common factor is as follows:

$F_1 = +0.213X_1 + 0.232X_2 + 0.233X_3 - 0.036X_4 + 0.063X_5 - 0.023X_6 + 0.038X_7 - 0.105X_8 - 0.032X_9 + 0.144X_{10} + 0.254X_{11} + 0.158X_{12}$

$F_2 = -0.068X_1 - 0.022X_2 + 0.022X_3 + 0.340X_4 + 0.369X_5 - 0.355X_6 - 0.011X_7 - 0.034X_8 - 0.054X_9 + 0.030X_{10} - 0.004X_{11} + 0.142X_{12}$

$F_3 = +0.082X_1 + 0.056X_2 - 0.184X_3 - 0.001X_4 - 0.111X_5 - 0.021X_6 + 0.461X_7 + 0.034X_8 + 0.472X_9 + 0.021X_{10} - 0.029X_{11} - 0.074X_{12}$

$F_4 = -0.040X_1 - 0.073X_2 - 0.081X_3 + 0.044X_4 - 0.145X_5 - 0.053X_6 + 0.007X_7 + 0.763X_8 + 0.050X_9 + 0.279X_{10} - 0.407X_{11} + 0.162X_{12}$

Table 5. Component Score Coefficient Matrix

	Component			
	1	2	3	4
X_1	0.213	-0.068	0.082	-0.040
X_2	0.232	-0.022	0.056	-0.073
X_3	0.233	0.022	-0.184	-0.081
X_4	-0.036	0.340	-0.001	0.044
X_5	0.063	0.369	-0.111	-0.145
X_6	-0.023	-0.355	-0.021	-0.053
X_7	-0.038	-0.011	0.461	0.007
X_8	-0.105	-0.034	0.034	0.763
X_9	-0.032	-0.054	0.472	0.050
X_{10}	0.144	0.030	0.021	0.279
X_{11}	0.254	-0.004	-0.029	-0.407
X_{12}	0.158	0.142	-0.074	0.162

Through the common factor expression obtained above, the four common factor scores of 39 listed companies in fintech field are calculated and sorted respectively. According to the cumulative contribution rate of the common factors in Table 3, the weights of the four common factors are 43.639%, 27.806%, 18.292% and 10.263% respectively. By substituting the weight into the common factor expression, we can calculate and rank the comprehensive growth scores of fintech listed companies. This paper only lists the top 5 and bottom 5 listed companies in fintech field, and their ranking is shown in Table 6.

3.4. Result Analysis

3.4.1. Overall Analysis

In this paper, 39 listed companies in the field of fintech are selected as the data sample, and 24 listed companies' comprehensive ability score is greater than zero, accounting for 61.54% of the total sample; There are 15 listed companies whose comprehensive ability score is less than zero, accounting for 38.46% of the total sample. The data shows that there are quite a few listed companies in the field of fintech, and the comprehensive ability is negative. It can be seen that the development of Listed Companies in China's fintech field is not good, and there is a large room for improvement.

Table 6. Score and Ranking of Fintech Listed Companies

	Profit ability Score	Ranking	Solvency Score	Ranking	Operation Ability Score	Ranking	Development Ability Score	Ranking	Comprehensive Ability Score	Ranking
300773.SZ	1.5796	2	1.2552	1	-0.3146	23	1.4538	3	1.1300	1
002987.SZ	0.9511	4	-0.6491	30	3.6934	1	0.2961	7	0.9405	2
600570.SH	1.4507	3	0.6103	16	0.0229	15	0.3169	6	0.8395	3
600446.SH	0.3439	13	1.0407	3	1.3834	3	-0.2405	19	0.6678	4
300059.SZ	1.6669	1	1.0942	2	-2.3389	39	-0.1215	15	0.5914	5
...	...	..	...	..	...	..	...	..	...	..
300377.SZ	-0.0280	27	-1.7725	37	-0.8831	35	-0.5269	34	-0.7207	35
300386.SZ	-0.0992	30	-2.4493	39	-0.3759	27	-0.2854	20	-0.8224	36
002530.SZ	-1.5952	36	-0.7002	31	-0.4298	28	-0.3000	21	-1.0002	37
002537.SZ	-3.3367	39	0.9058	6	0.1782	13	0.8224	5	-1.0872	38
300339.SZ	-3.0850	38	0.6452	15	-0.1512	18	0.0392	10	-1.1905	39

According to the data in the above table, the distribution range of comprehensive ability scores of 39 listed companies is [- 1.1905,1.1300], and the gap between the data is not big. In order to show the development of Listed Companies in the field of fintech more directly, this paper divides the comprehensive ability score of company development into four levels referring to the industry standards and the common practice of previous scholars:

①The high growth company is defined as the growth type I company whose comprehensive score of development is higher than 0.5.

②A company with a comprehensive score of 0~0.5 is defined as growth type II.

③The comprehensive growth score of the company is defined as the growth status of the company from -0.5 to 0.

④The weak growth company is defined as growth type IV, which is the company whose comprehensive score of development status is lower than -0.5.

According to the data in the above table, there are 6 growth type I companies with high growth, accounting for 15.39% of the total sample; 18 growth type II companies with sub growth, accounting for 46.15% of the total sample; There are 7 growth type III companies with general growth, accounting for 17.95% of the total sample, and 8 growth type IV companies with weak growth, accounting for 20.51% of the total sample.

3.4.2. Case Analysis

Lakala Payment Co.,Ltd (300773.SZ) had the highest comprehensive ability score of growth, and its comprehensive ability score was 1.1300. It can be seen from the above table that the scores of profitability, solvency and development ability of Lakala Payment Co.,Ltd are all higher than zero, and ranking fairly high, only the score of operation ability is less than zero, which is in the middle and lower reaches of the ranking. This shows that in the field of fintech, Lakala Payment Co., Ltd 's solvency, development and profitability are quite good, but its operating capacity is slightly weak, and the company pays more attention to the balanced development of various capabilities. Compared with Jiangsu HopeRun Software Co., Ltd (300339.SZ), which had the lowest comprehensive ability score of growth, its comprehensive ability score was only -1.1905. It can be seen from the above table that although the scores of solvency and development ability of Jiangsu HopeRun Software Co., Ltd are greater than zero, and the performance is good. But the scores of profitability and operation ability are very low, and its profitability is very worrying, which seriously hinders the overall performance of the company. And then we can't ignore the influence of each company's development ability. Only

having a certain ability can't make the company obtain a higher level of comprehensive ability, but ignoring a certain ability will drag down the company's comprehensive ability. The company should attach great importance the coordinated development of various abilities.

According to the relevant information, Lakala Payment Co., Ltd (300773.SZ) which ranked first in the comprehensive ability score, is one of the first domestic enterprises to obtain the third-party payment license issued by the central bank, and is China's leading fintech group. Focus on the integration of information technology and payment services for small and medium-sized businesses. At the same time, the company has a high sense of social responsibility, is willing to help poverty alleviation and education, actively develop Inclusive Finance and establish a good brand image, so the company can maintain a stable profit level and constantly improve the operation efficiency. Northking Information Technology Co.,Ltd (002987.SZ), the second in comprehensive ability score, is the leading financial and technological service provider in China. The company provides software and information technology services to customers with financial institutions as the main body, empowers the digital construction of enterprises, takes artificial intelligence technologies such as big data, block chain and cloud computing as the guide, deeply couples the cutting-edge technology and financial business scenarios, and becomes a new engine for the development of the industry. The company has a high brand reputation and stable customer relationship, which are the key to the stable and coordinated development of the company. Hundsun Technologies Inc (600570.SH), which ranks third in the comprehensive ability score, is the only company in China that provides fintech services in all fields. It has been listed in the global top 100 fintech companies for 13 years and ranked 40th in 2020. For many years, the enterprise has been taking technical service as the core, relying on many years of financial IT construction experience, as well as deep insight and understanding of the Internet, and continuously driving the innovation and development of financial institutions with high-quality products and services. Therefore, it has been highly recognized in the industry, forming brand advantages, so as to maintain its high profitability and development ability.

To sum up, although the operation modes of the three companies are different, they all attach great importance to scientific and technological research and development. The empirical research results show that attaching importance to scientific and technological research and development is a necessary condition for listed companies in the field of fintech to have a good development status, and also a necessary premise for them to take the lead in the same industry competition. In addition, attaching importance to the sense of social responsibility, establishing the company's reputation and strengthening the brand building are also conducive to the growth of listed enterprises in the field of fintech.

4. Conclusion and Suggestion

After the empirical research on the development of 39 listed companies in the field of fintech, we can draw the following conclusions: First, from a macro perspective, the development of Listed Companies in China's fintech field is relatively general, and there is a large space for growth. Second, the development of Listed Companies in China's fintech field is most affected by the company's profitability and debt paying ability. Second, the development ability and operation ability will also affect the company's growth. If an enterprise wants to have a better development situation, it should take all kinds of abilities into account and not be dragged down by one or more of them. Third, through the observation of companies with higher comprehensive ability scores, it is found that companies should not only pay attention to scientific and technological research and development, deepen the sense of innovation, but also strengthen brand building and enhance the company's image, so as to improve the core competitiveness and make the enterprise have high growth.

For enterprise managers, we can refer to this paper to build the evaluation index system of the development status of listed enterprises in the field of fintech, analyze and summarize the reasons for their own scores, and attach importance to and develop the factors with low scores. Profitability and solvency have the greatest effect on the development of Listed Companies in the field of fintech. If the score of this factor is low, we should focus on improving the two aspects of the company's ability. In the process of improving, we should also maintain the original high score factor. For enterprises with unsatisfactory profitability, we should increase the investment in science and technology, improve product premium, earn more profits and improve the level of profit.

For enterprise creditors, the most concern is the credit risk, that is whether the funds lent to the enterprise are safe, whether the enterprise can repay the principal and interest on time, which requires the enterprise to have good solvency. In the evaluation index system of the development ability of listed enterprises in the field of fintech, profitability and solvency have the greatest effect on the development of enterprises, so creditors can focus on the growth score of the company, judge whether the enterprise has good profitability to repay the principal and interest on time, so as to make reasonable decisions and improve the safety of funds.

For the majority of investors, through the score and ranking of four common factors and comprehensive ability in the evaluation index system of Listed Companies in the field of fintech, and according to their own risk appetite, the enterprises with excellent performance can be considered. Based on the analysis of each factor, combined with the different characteristics of each enterprise, this paper analyzes the investment value, finds the investment object, constructs the investment portfolio, reduces the investment risk and improves the investment income.

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