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The Diversification Strategy of Securities Firms in China from the Perspective of Enterprise Operational Sustainability

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Abstract: With the intensified competition in the capital market, the continuous development of internet finance, and the gradual loosening of market regulation, the profit pressure on securities firms relying on traditional business is increasing. In order to seek new profit growth points, many securities firms have ventured into business diversification, but with varying results. From the perspective of enterprise operational sustainability, econometric methods are used to explore the relationship between the diversification and business performance of securities firms in China, putting forward diversification strategies suitable for these firms.

Keywords: Securities firms; Diversification strategy; Econometric analysis; Business management

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1. Introduction

In comparison to developed countries, China's securities industry was late to emerge and subsequently underwent a period of fast growth following reform and opening-up. In 1987, the emergence of securities firms in Shenzhen Special Economic Zone marked an achievement in exceeding the zero benchmark in terms of the number of securities firms in China. As of now, the number of securities firms in China has reached more than 130. According to the statistics of China Securities Association, in the first three quarters of 2021, 140 securities firms in China achieved an operating revenue of 366.357 billion yuan and a net profit of 143.979 billion yuan, of which 124 securities companies achieved profits. However, with the continuous development of internet finance, the intensification of the capital market competition, and the reduction of government protection, securities, as one of the traditional financial industries, has been greatly impacted. The emergence of internet finance has greatly reduced the service fee; in addition, the profit pressure on securities firms relying on traditional business is increasing. In order to seek new profit growth points and comply with the development of the times, a number of securities firms have ventured into diversified operation and integrated financial consulting, refinancing, Shanghai-Hong Kong stock connect, new third board, and asset securitization on the basis of the three traditional businesses. However, after the influx of new businesses, the performance of various securities firms varies. Some companies' performance improved dramatically, while others are struggling.

Many experts have studied the relationship between business diversification and business performance of financial institutions; however, the results differ. According to Qu Chao and Gao Peng, the degree of diversification of securities firms has a nonlinear impact on their operating efficiency [1]. Wu Jian and Xie

Wei reached the same conclusion by using the threshold effect model [2]. According to Fang Jun [3], Xie Jia [4], Sun Guangtao [5], and Yu Jiao [6], the financial performance of financial institutions will first improve, and then deteriorate as their business diversification level increases. However, this conclusion is inconsistent as there are differing results from studies conducted by Mou Qingzhu [7], Lin Kunsen [8] Wang Zhifang [9], Bei Shuhua [10] and Krivokapic [11]. Mao Yingdong hopes that securities firms would consider the risks they face when implementing the diversification strategy [12].

In this context, this study assumes the financial data of 38 listed securities firms in China from 2015 to 2019 as samples, the return on total assets as the financial performance measurement index of securities firms, and the total assets, financial leverage ratio, stock market, and M2 growth rate of securities firms as the control variables; the adjusted Herfindahl-Hirschman index is quoted to measure the business diversification of securities firms, and a regression model is established to explore the relationship between the diversification and financial performance of listed securities firms in China.

2. Empirical research design

2.1. Model parameter definition

2.1.1. Dependent variable selection

When measuring the performance of securities firms, most predecessors use single financial indicators, such as operating gross profit margin, return on total assets, and return on net assets, to measure the operating performance of securities firms. Some scholars also measure the comprehensive performance of securities firms from the aspects of profitability, growth ability, asset quality, and solvency. The goal of the diversification strategy is to employ all the company's existing assets to boost operating income by diversifying the types of businesses in securities firms. Therefore, when analyzing the impact of diversification on the operating performance of a company, it is crucial to consider the relationship between the operating results and the total asset scale of the company, and the assets obtained through liabilities shall not be deducted. Therefore, the rate of return on total assets (ROA) is used as the measurement index of financial performance of securities firms. When enterprises implement business diversification strategy, it is impossible without the support of capital. Using the rate of return on total assets as the performance measurement index, they can deduct the impact of tax avoidance effect caused by liabilities.

2.1.2. Independent variable selection

At present, the commonly used methods for quantifying the degree of enterprise business diversification include business counting method, entropy index method, and Herfindahl-Hirschman index method. Among these three methods, the business counting method is too simple to effectively reflect the proportion of various businesses of securities firms. Both the entropy index method and Herfindahl-Hirschman index method are able to measure related diversified businesses and non-related diversified businesses. However, entropy index does not express the degree of correlation between businesses, while Herfindahl-Hirschman index enlarges the gap between related businesses. Therefore, Herfindahl-Hirschman index is more suitable for measuring related businesses, while the entropy index method has more comparative advantages in measuring unrelated diversification. As the securities firms studied in this paper are all financial businesses and businesses related to the capital market, it is not suitable to use the entropy index method, rather the Herfindahl-Hirschman index method is more suitable to measure the business diversification of securities firms. In order to better reflect the business diversification of securities firms, this paper will use the adjusted Herfindahl index. The formula is shown as follows:

$$HHI^{*} = 1 - \frac{DM^{2} + DS^{2} + CB^{2} + CA^{2} + IC^{2} + ZG^{2} + MT^{2} + GH^{2} + SP^{2} + OB^{2}}{BI^{2}}$$

HHI * represents the adjusted Herfindahl-Hirschman index; *DM* is the income from securities trading business; *DS* is the income from the agency sales of financial products; *CB* refers to the income from underwriting and recommendation business; *CA* is the income from financial advisory business; *IC* is the income from investment consulting business; *ZG* is the income from asset management business; *MT* refers to financing business income; *GH* is the agreed repurchase business income; *SP* refers to the income from stock pledge business; *OB* refers to other business income; *BI* is the total business income. Since the measurement software does not support special symbols for sequence naming, *HHI*, in the result of subsequent empirical analysis, indicates *HHI* *, while HHI^{2} indicates HHI^{*2}.

2.1.3. Control variable selection

In addition to the above selected variables, the operating performance of securities firms is also affected by stock market conditions, the asset scale of securities firms, the M2 growth rate, and the financial leverage ratio. Therefore, the aforementioned four indicators are selected as exogenous variables; namely, control variables. The definition for all parameters are shown in **Table 1**.

Table 1. Definition of variables

Variable	Symbol	Definition
Explained variable	*ROA*	Financial performance: Return on total assets
Explanatory variable	*HHI* * HHI^{*2}	Degree of business diversification: Adjusted Herfindahl index
	SM	Stock market quotation: Daily average closing price of Shanghai Composite Index for the whole year
Control variable	*TA*	Asset scale: Total assets
	M2	Growth rate: Broad money growth rate
	FI	Financial leverage ratio: Total assets / Net assets

2.2. Regression model setting

Since the sample data in this paper are panel data, the regression model adopted can only be determined after F test and Hausman test. Different regression models have different definitions of random error term μ, so the random error term μ is not discussed when establishing the model; instead, only variables are considered. The configuration of the model is shown as follows:

$$ROA_{i,t} = C_{i,t} + \beta_1 HHI_{i,t}{}^{*} + \beta_2 HHI_{i,t}{}^{*2} + \beta_3 SM_{i,t} + \beta_4 TA_{i,t} + \beta_5 M2_{i,t} + \beta_6 FI_{i,t}$$

C is the intercept term; β_i is the coefficient of the given variable; $ROA_{i,t}$ is the return on total assets of the *i*th securities firm in the *t* year; $HHI_{i,t}{}^{*}$ is the adjusted Herfindahl index of the *i*th securities firm in year *t*; *SM* is the daily average closing price of Shanghai Composite Index for the whole year; *TA* is the total assets of the securities firm; *FI* is the financial leverage ratio of the securities firm.

3. Empirical analysis

3.1. Descriptive statistics and correlation analysis

3.1.1. Descriptive statistics

The samples selected in this paper include a total of 38 securities firms that are both members of China Securities Association and listed in Shanghai and Shenzhen exchanges, excluding st, *ST, and securities companies that do not publish their business income data. All data are derived from China Securities

Association, Oriental Wealth Data Center, Sina Financial Data Center, the official website of the National Bureau of Statistics, Wind database, CSMAR database, and the companies' official websites.

It can be seen from **Table 2** that the average return on total assets of 38 securities firms in five years was about 2.26%, with the highest about 8.11%, and the lowest about -3.75%; the standard deviation was 0.0173. The overall level had a right deviation distribution. The adjusted average value of Herfindahl index was about 0.79, with a maximum value of 0.86 and a minimum value of 0.45, which was generally distributed as a left leaning peak. The average value of total assets was 44.47215 billion yuan, and there was a large difference in total assets among individuals, with a standard deviation of more than 100 billion yuan. The average financial leverage ratio was 2.86. From 2017 to 2021, the average daily closing price of SSE 50 Index was 3003.68, with a maximum of 3699.99, and a minimum of 2919.54. The average growth rate of M2 was 8.7% and the maximum was 13.3%.

Table 2 Descriptive statistical analysis

Variable	Median	Mean value	Maximum value	Minimum value	Standard deviation	Skewness	Kurtosis
ROA	2.573516	2.265086	8.1151	-3.7499	1.733262	0.717579	4.441583
*HHI **	0.735382	0.752882	0.842245	0.412626	0.069734	-1.604231	6.568296
*HHI *²*	0.545623	0.566831	0.709377	0.17026	0.095153	-1.176385	4.694154
SM	3.163211	3.003684	3.699994	2.919537	0.293644	1.004189	2.435673
TA	795.1416	444.7202	6215.151	25.4948	1048.141	2.40437	8.914156
M2	9.9	8.7	13.3	8.1	2.07622	0.645451	1.746283
FI	2.892842	2.86	4.8	1.03	0.69881	0.074481	3.05722

3.1.2. Correlation analysis

Table 3 shows the results from the correlation analysis of all the variables. It can be seen from the table that the return on total assets of securities firms has a significant positive correlation with the stock market, *SM*, and the broad money growth rate, *M2*. This is because when the stock market is good or the country adopts loose monetary policies, the stock market trading will become active and the profits of securities firms will increase.

Table 3. Correlation coefficient matrix

Variable	*ROA*	*HHI*	*HHI²*	*SM*	*TA*	*M2*	*FI*
ROA	1.00000						
HHI	-0.48591	1.00000					
HHI²	-0.47874	0.99610	1.00000				
SM	0.67738	-0.49255	-0.48299	1.00000			
TA	0.16780	-0.14414	-0.14594	0.35480	1.00000		
M2	0.70652	-0.54856	-0.54807	0.70395	0.29731	1.00000	
FI	-0.16825	0.16647	0.17516	0.08579	0.02824	0.03585	1.00000

3.2. Unit root test and determination of regression model

In order to avoid pseudoregression, this study uses EViews to test the unit root of all sequences. **Table 4** shows the results of each variable sequence. It can be seen from the table that all the time series are stationary series.

Table 4. Stability results

Variable	Test conclusion	Explanation
ROA	Stable	Only intercept term and no error term are included
HHI	Stable	Only intercept term and no error term are included
HHI^2	Stable	Only intercept term and no error term are included
SM	Stable	Only intercept term and no error term are included
TA	Stable	Only intercept term and no error term are included
M2	Stable	It contains neither intercept term nor error term
FI	Stable	Only intercept term and no error term are included

In order to determine whether the selected panel data are suitable for mixed effect model analysis or fixed effect model analysis, F-test is performed on the sample data. After testing, the sum of squared residuals of the random effect model, SSE_r, is 213.8427, the sum of squared residuals of the fixed effect model, SSE_u, is 114.8241, the number of periods, t = 5, the number of individuals, n = 38, the number of explanatory variables, k = 6, and the F value is 3.402787771. According to the table, at a significant level of 5%, the molecular freedom is 37, the denominator freedom is 146, and the corresponding F value is 1.492587501; i.e., f > F0 05 (37146). If the F value falls into the rejection region, the original hypothesis should be rejected, and the fixed effect model should be selected from the mixed effect model and the fixed effect model.

The purpose of Hausman test is to select a more suitable regression model between the fixed effect model and the random effect model. The results showed that the p value is 1.0000, and the original hypothesis cannot be rejected. Therefore, the random effect model should be selected as the regression estimation model in this paper.

3.3. Regression analysis

Through the above test and analysis, the random effect model is selected as the regression analysis model in this paper. The estimation results of EViews are shown in **Table 5**.

Table 5. EViews estimation results

Variable	Correlation coefficient (T statistic)	Variable	Correlation coefficient (T statistic)
*HHI **	-18.79169** (-2.614711)	C	-1.577984 (-0.642724)
*HHI *²*	14.21751** (2.408418)	DW	1.842653
SM	2.422559*** (4.920663)	R^2	0.696768
TA	-0.000241** (-2.603246)	Adjusted R^2	0.686826
M2	0.400867*** (5.331986)	F	70.08294
FI	-0.423971*** (-2.722093)	*p*	0.000000

From **Table 5**, it can be seen that all explanatory variables of the model can explain 69.53% of the total change of financial performance of securities firms. The *DW* value of the model is 1.842653, which is close to 2, indicating that the autocorrelation of the independent variables of the model is not significant. The F value of the model is 70.08294 and the corresponding *p* value is 0.00000, indicating that there is a significant linear relationship between the financial performance of securities firms and the explanatory variables. The coefficient of *HHI* * is negative, and the coefficient of *HHI* *^{2} is positive, which is significant at the level of 5%. This shows that there is a 95% probability that the diversification of securities firms does have a significant impact on their financial performance. The impact relationship is nonlinear with a positive U-shape curve. The financial performance of securities firms will first decline with increasing business diversification, then it will progressively improve after reaching the lowest point. Calculating the partial derivative of *HHI* *^{2} for ROA and making the partial derivative equal to 0, the *HHI* * value at this point is 0.660864314. This figure represents the point at which the degree of business diversification of securities firms has a positive to negative effect on the financial performance. There is a negative correlation between the degree of business diversification of securities firms and their financial performance before this point. After this point, the correlation between the two changes from negative to positive; that is, when the *HHI* * value is lower than 0.660864314, the diversification will reduce the return on total assets of the company. When the *HHI* * value is 0.660864314, the performance of the securities firm reaches the bottom. When the *HHI* * value is higher than 0.660864314, the diversification will increase the company's return on total assets.

In order to ensure that the robustness of the empirical results will not change due to changing samples or variable measurement methods, this paper changes the index measurement method for robustness test and the financial performance measurement index of securities firms from the rate of return on total assets to the rate of return on net assets, reconstructs the model, and then conducts the empirical analysis again. The results showed that the economic significance of the model is the same as that of the previous regression model even after changing the financial performance measurement indicators, indicating that the previous regression analysis results are stable and the relationship between the degree of diversification of securities firms and their financial performance is relatively reliable and is of great reference value.

4. Conclusion

Based on the empirical results, the diversification of securities firms does have a significant impact on their financial performance, and the impact relationship is nonlinear with a positive U-shape curve. China established its first securities firm in 1987. Most securities firms have been in business for no more than 25 years. At the beginning of their establishment, their business is relatively single. After the gradual development of the internet, upon entering a period of rapid growth in 2020, their business gradually enriched. Therefore, the period for securities firms in China to begin diversification is extremely short. At present, the degree of business diversification of most securities firms does not exceed the scope that securities firms can bear for the time being, and the effects from economies of scope and economies of scale have played prominent roles.

Therefore, when expanding new businesses and increasing the diversity of their own businesses, securities firms should consider the current situation of their companies' operation and fully consider their own development period, development status, as well as external development environment. They should not blindly adopt the diversification strategy; otherwise, their companies' operation burden would intensify, resulting in irreversible repercussions. Countermeasures should be formulated in advance for securities firms with a low degree of diversification and single business when the company needs to implement new businesses in view of transformation as a form of psychological preparation for the possible decline of the company's overall profit margin in advance. For enterprises with a high degree of diversification, when

adding new businesses, a good assessment of the overall risk of the enterprise should be made, so as to avoid excessive diversification of the company's business and increasing the risk of bankruptcy.

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Disclosure statement

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