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The Relationship between the Factors of the Ownership Structure and the Earnings Per Share[1]

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Abstract: The 100 listed companies were selected randomly in 2008 in the Shanghai Stock Exchange. The two linear independent factor 1 and factor 2 were extracted through analyzing the top ten shareholders of the 100 listed companies. At the same time the 100 listed companies two factors scores o were computed. The two factors were divided into the larger classes and the smaller classes according to the two factors scores order. The earnings per share were divided into the larger class and the smaller class in accordance with the earnings per share rank. The log-linear model was established by the two factors as the independent variables and the earnings per share as the dependent variable. Finally three variables were done as the single factor multivariate covariance analysis. The factor 1 was significant on the earnings per share. But the factor 2 and the interaction of the rank factor1 and the factor 2 were not significant on the earnings per share.

Key words: the log-linear model; the covariance analysis; the ownership structure; the factor; the earnings per share

1. INTRODUCTION

The ownership structure is the shareholders composition and all kinds of shareholders proportion and the stock concentration and the shareholders stability. It plays the important role in the shareholders rights means and the director board and the company's control. It will be the most basic factors (LIU. 2009).

The ownership structure is an important corporate governance component. It has a close relationship with the corporate governance efficiency and has a greater impact on the corporate governance mechanism. In a certain sense the ownership structure can decide the company governance and the corporate behavior. Since the company's ownership structure is different, The shares behavior is different and the corporate governance mechanisms effect is not the same, too .Therefore only to choose the optimal ownership

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structure, improve the corporate governance in order to ensure the company achieved good operating results.

The following models analyze the factors of the top ten shareholders and identify the key factors and find the relationship between the earnings per share which reflects one of the performance indexes and the enterprise important factors.

2. MODEL

Sample selection:

The market quality indexes of the No.600000 to the No.600118 listed companies in the Shanghai Stock Exchange stocks in 2008 were selected random as the samples.

Samples Source:

The Panorama Network (http://www.p5w.com).

The Giant Tidal Information Network (http://www.cninfo.com.cn).

Sample data processing:

The top ten shareholders proportion data of the No. 600000 to the No.600118 listed companies were got from the panoramic network. The top ten shareholders proportions were analyzed as the factor and two factors were obtained.

The first factor eigenvalue was 6.158.The total variance contribution rate of explaining the original 10 variables was 61.584%.The cumulative variance contribution rate was 61.584%.The second factor eigenvalue was 1.653. The total variance contribution rate of explaining the original 10 variables was 16.530% The cumulative variance contribution rate was 78.114.The two factors together explained the total variance contribution rate of the 10 original variables was 78.114%. The two factors reflected the majority original information .The factor analysis effect was good. The cumulative variance ratio has not changed, but the two factors explaining the variance of the original variables were redistributed and each factor weights were changed and made it easier to explain the factors when the factors were rotated. Then the first factor eigenvalues was 5.943.The total variance contribution rate of explaining the original 10 variables was 59.428%. The cumulative variance contribution rate was 59.428%.The second factor eigenvalue was 1.869. The total variance contribution rate of explaining the original 10 variables was 18.686% .The cumulative variance contribution rate was 78.114.

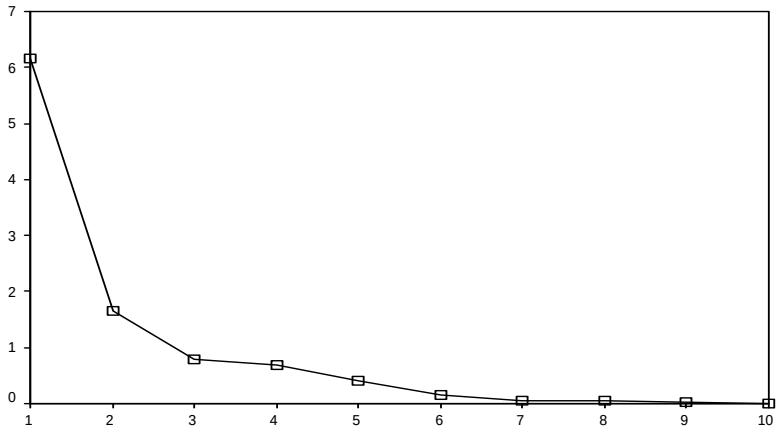

Figure 1 Common F actor Stone Figure

The horizontal coordinate is the factor number and the vertical coordinate is the characteristic value in the figure 1. The first factor characteristics was highest, the contribution explaining the original variables was greatest. The eigenvalues of the third, the fourth and the fifth were smaller .The contribution rates explaining the variables were small and it can be ignored. Therefore the two factors extracted were appropriate.

The factor scores coefficients were calculated according to the regression algorithm .The average score coefficients that the first factor impacting on the ten shareholders were-0.042, -0.102, -0.05, 0.088, 0.142, 0.144, 0.170, 0.178, 0.176, 0.169. The average score coefficients that the second factor impacting on the ten shareholders were -0.207,0.476,0.486,0.190,0.059,0.057, -0.056, -0.103, -0.110, -0.099.

F_1=−0. 042 the largest shareholder −0. 102 the second largest shareholder −0. 05 the third largest shareholder+0. 088 the fourth largest shareholder+0. 142 the fifth largest shareholder+0. 144the sixth largest shareholder+0. 17 the seventh largest shareholder+0. 178 the eighth largest shareholder+0. 176 the ninth largest shareholder+0. 169 the tenth largest shareholder

F_2 =−0. 207 the largest shareholder +0. 476 the second largest shareholder +0. 486 the third largest shareholder +0. 190 the fourth largest shareholder +0. 059 the fifth largest shareholder +0. 057 the sixth largest shareholder −0. 056 the seventh largest shareholder −0. 103 the eighth largest shareholder −0. 110 the ninth largest shareholder −0. 099 the tenth largest shareholder

The ten shareholders loads on every factor were obtained using the principal component analysis making the variance greatest rotating. The ten shareholders loads on factor1 were respectively -0.448, -0.146, 0.170, 0.704, 0.902, 0.913, 0.955, 0.958, 0.942, 0.912. The ten shareholders loads on factor2 were respectively -0.427, 0.792, 0.860, 0.439, 0.248, 0.246, 0.059, -0.021, -0.036, -0.021.The fourth, the fifth, the sixth, the seventh, the eighth, the ninth , the tenth shareholders loads on the first factor was the higher .The first factor that explained major the seven variables and the fourth to the tenth shareholders can be regarded as an interest group .The second and the third shareholders loads on the second factor were higher. The second factor explained major the two variables. The second and third largest shareholder can be regarded as an interest group. The largest shareholder load on two factors was similar .The largest shareholders had a relative balance power on the two interest groups.

The factor 1 and the factor 2 scores were ordered from big to small .According to the factor 1, the 100 listed companies were split into two groups and each group had 50 listed companies. The factor 1 value that was bigger was recorded as 1 class. The factor 1 values which was smaller was recorded as 2 class .At the same time, the factor 2 value that was bigger was recorded as 1 class .The factor 2 values which was smaller was recorded as 2 class.

2.1 Log-linear model

The earnings per share of the 100 listed companies were ranked from the large to the small and were divided into two groups and every group had 50 listed companies. The earnings per share that was larger class was recorded as 0 .The earnings per share that was smaller class was recorded as 1.

The earnings per share are ratio of the total equity and the profit after-tax. It is one of the important investments indexes. The formula is:

Earnings per share =the net profit after-tax/ the total equity

The earnings per share are the commercial stock performance measurement, and is only financial ratios in the financial statement. The investors and the financial analysts evaluate the company's operating performance, forecast the future prospects and select the investment decisions or the business decisions according the earnings per share (YANG. 1996). Two categories of the factor 1 and factor 2 were recorded as independent variables. Establish the log-linear model using the logit process.

The so-called two-dimensional contingency table log model relate to two factors A and B. The i level of A factor and the j level of B factor correspond the frequency of the lattice denoted f_{ij} 。Under normal circumstances, each lattice subjects to frequency distribution. If the cell frequency is taken the natural logarithm, it is assumed that various factors impacting on the cells frequency subject to the following formula:

$\ln(u_{ab})$ = ln (Constant) + ln (A main effect) + ln (B main effect) + ln (the interaction of A and B)

The $\ln(u_{ab})$ denotes u , the ln (A main effect) denotes α_{α} , the ln ((B main effect) denotes $(\alpha\beta)_{ab}$ and the ln (the interaction of A and B) denotes $(\alpha\beta)_{ab}$, Then the formula becomes:

$$\ln(u_{ab}) = u + \alpha_{\alpha} + \beta_{b} + (\alpha\beta)_{ab}$$

This is the two-dimensional contingency table log-linear model. The multidimensional contingency table model is many factors. The model contains all main effects and interaction terms are known as the saturated model. The no statistically significant interaction items are removed from the saturated model that is called unsaturated model or minimal model (ZHANG. 2004).

First the model goodness fit was tested, the likelihood ratio test value was 1.116, the Pearson value was 1.113 and the test probability is 0.291. There were no significant differences indicating non-saturation model goodness fit which compared with the saturated model that includes the interact items. This model reflected fully the three variables relationship.

The concentration and the entropy react the explain degree. The total entropy of the model was 69.295.The entropy that was explained by the model was 6.616 .The residuals entropy was 62.679. Therefore, the model interpretation degree measured by entropy was 6.616/69.295 = 0.095. The overall concentration of the model was 49.980 .The concentration that was explained by the model was 6.314.The residual concentration was 43.666, .Therefore the model interpretation degree measured by concentration was 6.314/49.980 = 0.126.

Table 1: Parameter Estimation

Parameter		Estimate	Ballroom	Z value	Test probability	95% confidence interval	
						Lower limit	Limit
Constant	[Factor 1 = 1] * [factor 2 = 1]	2.551					
	[Factor 1 = 1] * [factor 2 = 2]	1.644					
	[Factor 1 = 2] * [factor 2 = 1]	2.783					
	[Factor 1 = 2] * [factor 2 = 2]	2.823					
[Earnings per share = 0]		-. 324	.342	-. 947	.344	-. 993	.346
[Earnings per share = 1]		0	.	.	.	.	.
[Earnings per share = 0] * [factor 1 = 1]		1.441	.449	3.210	.001	.561	2.322
[Earnings per share = 0] * [factor 1 = 2]		0	.	.	.	.	.
[Earnings per share = 1] * [factor 1 = 1]		0	.	.	.	.	.
[Earnings per share = 1] * [factor 1 = 2]		0	.	.	.	.	.
[Earnings per share = 0] * [factor 2 = 1]		-. 886	.449	-1.973	.049	-1.766	-. 006
[Earnings per share = 0] * [factor 2 = 2]		0	.	.	.	.	.
[Earnings per share = 1] * [factor 2 = 1]		0	.	.	.	.	.
[Earnings per share = 1] * [factor 2 = 2]		0	.	.	.	.	.

The table1 was the model parameter estimate. There were 14 parameters in the model. The constants of any combination independent variables were estimated. The standard error, the Z values which subjects to the standard normal distribution and the 95% confidence interval of the regression coefficient of three parameters among the remaining 10 coefficients were given. The parameters 1, 2, 3 and 4 were the constants .The parameter 5 was the main effect term of the earnings per share. The parameter 7 was the interaction item of the earnings per share and the factor 1 .The parameter 11 was the interaction items of the earnings per share and factor 2.

The statistical coefficients can be tested by the Z values or the confidence interval of the regression coefficients 95%. If the Z value is greater than 1.96 or the confidence interval of the regression coefficients does not contain 0, the regression coefficients corresponding items is significant or is not significant .The Z value of the seventh parameters was 3.210 , the confidence interval was [0.561,2.322], and the testing the probability was Sig. = 0.001. The seventh parameters had significant. The dependent variable the earnings per share and the independent variables factor 1 existed the interaction after controlling the confounding effect of factor 2.

The correlation coefficient of the earnings per share and the interaction effect of the earnings per share and the factor 1 was -0.468. The correlation coefficient of the earnings per and the interaction effect of the

earnings per and the factor 2 was -0.453. The correlation coefficient of the interaction effect of the earnings per share and the factor 1 and the interaction effect of the earnings per share and the factor 2 was -0.302.

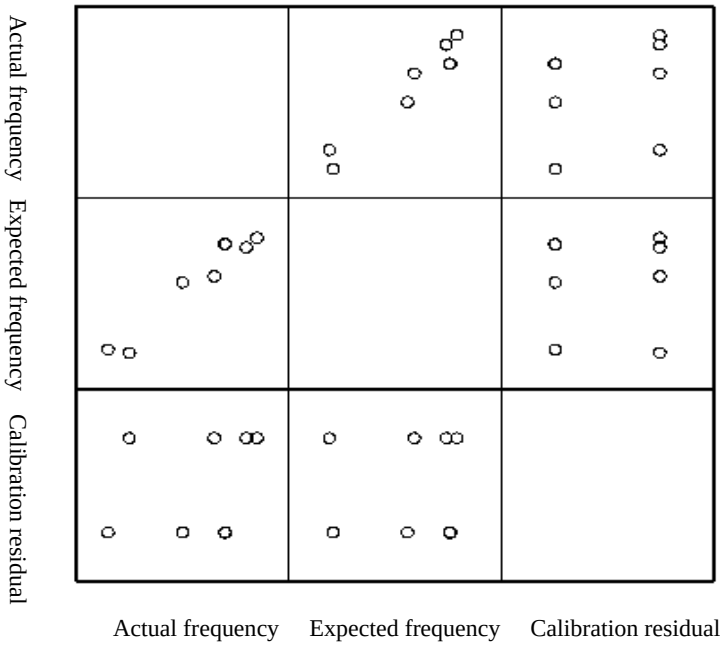

Figure 2: Scatter Matrix

The figure 2 showed the actual frequency, the expected frequency and the calibration residuals scatter matrix. The horizontal axis of the first row middle grid was the expected frequency and the vertical axis was the actual frequency. The horizontal axis of the left of the second row was the actual frequency and the vertical coordinates was the expected frequency. If these two grids do some spin, you will find they were exactly the same. From the observation frequency and the calibration residuals scatter plot showed the eight scatter dots had obviously certain trends. These plot indicated that the residuals were not normally distributed .The fit model can not explain fully the number distribution. Perhaps the significant variables do not be included. (Actually the interaction terms do not be included).

2.2 The simple dependent and multivariate variance analysis

The earnings per share of the top 100 listed companies was regarded as the dependent variable , the two classification of the factor 1 and the factor 2 were regarded as the fixed variables ,according to the research of Mock (1988) and McNair (1990)and others (HU. 2001). To get the natural logarithm of the total assets, the net profit growth rates and the gearing ratio were regarded as the covariate variables, the covariance analysis were conducted.

The covariance analysis is to choose those factors that it is difficult to control as the covariates variables. Analyzing the control factors impact on the test variables excluding the covariates influence and analyze accurately the control factor. That is to compare the each factor different levels differences and analyze whether have the interaction among the various factors removing the effect of one or more covariate to the dependent (TAN, MEI. 2007).

Known F (3, 95) = 0.522, Sig. = 0.668 through the homogeneity tests. Thus the overall variance of each group can be considered is homogeneous and meet the variance prerequisite test.

Table 2: Multivariate Variance Analysis

Source	Squares	Freedom	Mean square	F value	Test probability
Analysis of variance model	9.115	6	1.519	4.819	.000
Intercept	.947	1	.947	3.004	.086
The natural logarithm of total assets	2.207	1	2.207	7.001	.010
Net profit growth rate	.691	1	.691	2.192	.142
Gearing ratio	2.371	1	2.371	7.522	.007
Factor 1	2.856	1	2.856	9.060	.003
Factor 2	.984	1	.984	3.120	.081
Factor 1 * Factor 2	.512	1	.512	1.624	.206
Error	29.003	92	.315		
Total	45.293	99			
Total correction	38.118	98			

The model check of the variance analysis was F = 4.819, Sig. = 0.000 on table 2. The model has the statistical significance. The statistical analysis of the factor 1 was F = 9.060, Sig. = 0.003. The factor 1 had a significantly affecting the earnings per share. The statistical analysis of the factor 2 was F = 3.120, Sig. = 0.081.The factor 2 had not significantly affecting the earnings per share. The statistical analysis of interaction of the factor 1 and the factor 2 was F = 1.624, Sig. = 0.206, .So the interaction of the factor 1 and the factor 2 on the dependent variable the earnings per share had no significant difference. The statistical analysis of the natural logarithm of the total assets was F = 7.001, Sig. = 0.010, the total assets impacting on the earnings per share was significant. The statistical analysis of the gearing ratio was F = 7.522, Sig. = 0.007, the gearing ratio impacting on the earnings per share was significant. The statistical analysis of the net profit growth was F = 2.192, Sig. = 0.142, the net profit impacting on the earnings per share was not significant.

3. CONCLUSIONS

The first, second, and the third shareholders of the top ten shareholders proportion structure impacting on the earnings per share were significant .The company could choose the right investment and access to high return if the three shareholders proportions was designed scientific and rational. At the same time the gearing ratio and the total assets impacting on earnings per share is also significant. N The top three shareholders proportion and the earnings per share interact. That is the two influence each other. According to it, the earnings per share should be referenced to design the three shareholders proportion in turn.

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