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The Relationship Between the Adjusting Earnings Per Share and the Market Quality Indexes of the Listed Company[1]

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Abstract: The adjusting earnings per share can be more directly reflect the list companies the main business income's net profit. Selected the independent variables by the stepwise method in the 11 market quality indexes by the Shanghai Stock Exchange 100 listed companies samples, and established the multiple linear regression model among the relative effective spread, the liquidity index as the independent variables and the adjusting earning per share as a dependent variable. The linear relationship was significant and the residual random variable distribution was the normal distribution and the variance homogeneity assumption was established.
Keywords: the adjusting earnings per share; the relative effective spread; the liquidity index; the multiple linear regression; the market quality indexes

1. INTRODUCTION

The non-recurring gains and losses usually refers to relate directly to the income and expenditure the main business , including the operating income, the operating expenses, the stock disposal income, the subsidy income and other subjects. The earnings per share including non-recurring gains and losses reflect the company's overall profitability. Per share after deducting non-recurring gains and losses is to better reflect the company's main business profitability. We should refer per share after deducting non-recurring gains and losses when evaluating the company's investment value, and make the right investment choices combing with the other indicators.

Net earnings per share (adjusting earning per share) = net profit after non-recurring earnings per share[4].

The china stock market is the earlier stages than the foreign stock market. The market quality is the core competitiveness comprehensive reflection and is the guidelines to promote the market innovation and development to the market organizers and is the important investment basis to the investors.[5]

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The random variable Y often relates to with a number of common variables $x_1, x_2, ..., x_p (p > 1)$ in the practical problems. The Y has a distribution when the $x_1, x_2, ..., x_p$ are a group determined value .If the Y mathematical expectation exists and it is the $x_1, x_2, ..., x_p$'s function, then it is denoted $u(x_1, x_2, ...x_p)$. The $u(x_1, x_2, ...x_p)$ are the regression function of the Y about the $x_1, x_2, ..., x_p$ .If $u(x_1, x_2, ...x_p)$ is the linear function of the $x_1, x_2, ..., x_p$, then it is the multiple linear regression model.

$$Y = b_0 + b_1 x_1 + b_2 x_2 + ...b_p x_p + \varepsilon, \varepsilon \square N(0, \sigma^2)$$

The $b_0, b_1, ..., b_p, \sigma^2$ are the independent parameters and have no related to the $x_1, x_2, ..., x_p$.(SHENG et al., 2008)

What is the relationship the market quality indexes with the investment earnings?

2. MODEL

Sample selection:

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

Samples Source:

The Market Quality Report in the Shanghai Stock Exchange (2009) (In fact it is the data of the market quality in 2008).

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

Sample data processing:

The adjusting earning per share as the dependent variable and all the market quality indexes (the price impact index, the liquidity index, the large transaction costs, the 10 stalls total and the relative bid-ask spread, the relative effective spread, the volatility, excess volatility, the return volatility, the price efficiency coefficient and the pricing error coefficient) as the independent variables will do regression analysis using the Spss software.

The stepwise approach selects the independent variable in order to avoid variables highly correlation. The stepwise approach standard is the F statistic theoretical probability χ .If the independent variable partial F statistic probability P value is less than 0.05, the independent variable has a significant linear effect on the dependent variable and should enter the regression equation, meanwhile reject the null hypothesis tests. If the independent variable partial F statistic probability P value is greater than 0.1, the independent variable has not a significant linear effect on the dependent variable and should remove the regression equation.

The relative effective spread was entered in the first step. The liquidity index was entered in the second step. The multiple correlation coefficient R increased from 0.459 to 0.525 .The square multiple correlation coefficient increased from0.211 to 0.276 .The regression equation explained the 27.6% variation of the dependent variable. The adjusted correlation coefficients ranged from 0.203 to 0.261.These values respond the intensity correlation between the independent variables and the dependent variable .The greater are these values, the stronger is the correlation. The estimate standard error reduced from 0.518049 to 0.4989940.After the three independent variables were entered, the F test statistic was 18.261 and the test probability was 0. These two values indicated the dependent variable and independent variables had significant linear relationship and a linear model can be founded.

Table 1: Model

Model		Non-standardized coefficient		Standardized coefficient	t value	Significance level
		Beta value	Standard error	Beta value		
1	Constant	1.828	.322		5.682	.000
	Relative effective spread	-. 033	.006	-. 459	-5.094	.000
2	Constant	1.547	.324		4.767	.000
	Relative effective spread	-. 029	.006	-. 405	-4.557	.000
	Liquidity Index	.000	.000	.260	2.924	.004

The table 1 showed the regression model constant, the non-standardized regression coefficient B values and their standard errors, the standardized regression coefficient B value, the t value and the significance level. Therefore the regression equation was:

The adjusting earnings per share = 1.547-0.029 the relative effective spread

The regression coefficient significance level were 0, 0.004 which were less than respectively 0.05.The linear relationship was significant and a linear model can be founded.

The effective spread in the regression model is a difference between the order real transaction price and the sell-buy order mid-point price. The higher is the effective spread, the higher is the order actual implementation cost. The P_{it} is the weighted average price of the stock i in the moment t. The P_{Mit} is the average pose of the best purchase price of the purchase price and the selling price of the stock i in the moment t. Then t he effective spread of the stock i in the moment t is:

$$\text{Absolute effective spread} = 2\left|P_{it} - P_{Mit}\right|$$

$$\text{Relative effective spread} = \frac{2\left|P_{it} - P_{Mit}\right|}{P_{Mit}} \times 100\%$$

The weighted average effective spread of the stock i in d Days is:

$$\text{Absolute effective spread} = \sum_{t=1}^{n} 2\left|P_{it} - P_{Mit}\right| W_{it}$$

$$\text{Relative effective spread} = \sum_{t=1}^{n} \frac{2\left|P_{it} - P_{Mit}\right|}{P_{Mit}} W_{it} \times 100\,\%$$

Among W_{it} is the proportion of the stock i in t moment of accounted for the continuous time of the total transaction time a day .

The mobility impact index is also known as the price cost index .It is the transaction price when the some extent changing of the order price .The bigger is the mobility impact index , the better is the market liquidity. The $A_1, A_2, A_3, \ldots A_k$ are many selling prices of the stock i in the moment and $A_1 < A_2 < A_3 < \ldots < A_k$. The $S_1, S_2, S_3, \ldots S_k$ are the corresponding number of $A_1, A_2, A_3, \ldots A_k$. The $B_1, B_2, B_3, \ldots, B_k$ are the buying prices of the stock i in the moment and $B_1 > B_2 > B_3 > \ldots > B_k$. The $D_1, D_2, D_3, \ldots D_k$ are the corresponding number of the $B_1, B_2, B_3, \ldots, B_k$. Then the mobility index in the moment t which makes the price increase Δ is

$$\sum_{j=1}^{k=1} S_j A_j + A_k \text{ among } k = \left\{ \min(\ m\ ) \left| \frac{|A_m - A_1|}{A_1} \geq \Delta \right. \right\}$$

The mobility index in the moment t which makes the price decrease Δ is

$$\sum_{j=1}^{k=1} S_j B_j + B_k \text{ among } k = \left\{ \min(m) \left| \frac{|B_m - B_1|}{B_1} \geq \Delta \right. \right\}$$

The price mobility index which is up or down 1% in the moment t is the average of the mobility index increasing and decreasing.

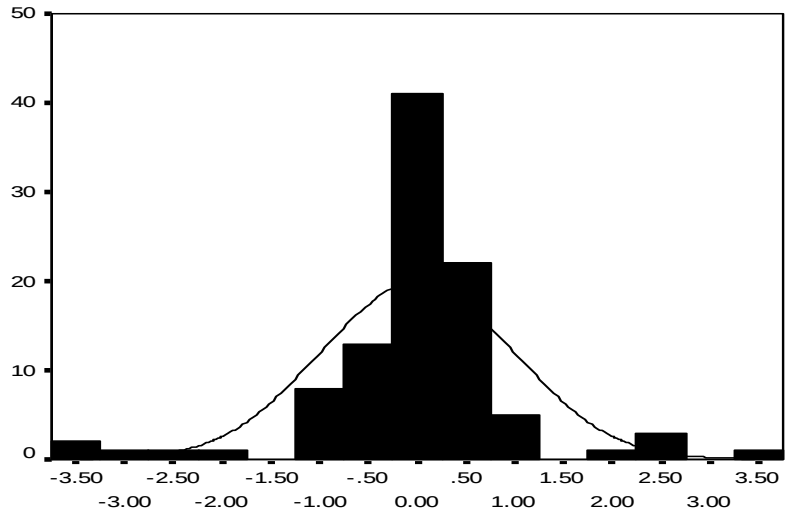

Figure 1: Residuals Histogram

The residual normal is assumed to be normal distribution in the regression analysis.(TAN & MEI, 2007) The figure 1 was based on sample data. The results showed that the residuals compared with the normal histogram comparison. The residual was normal distribution.

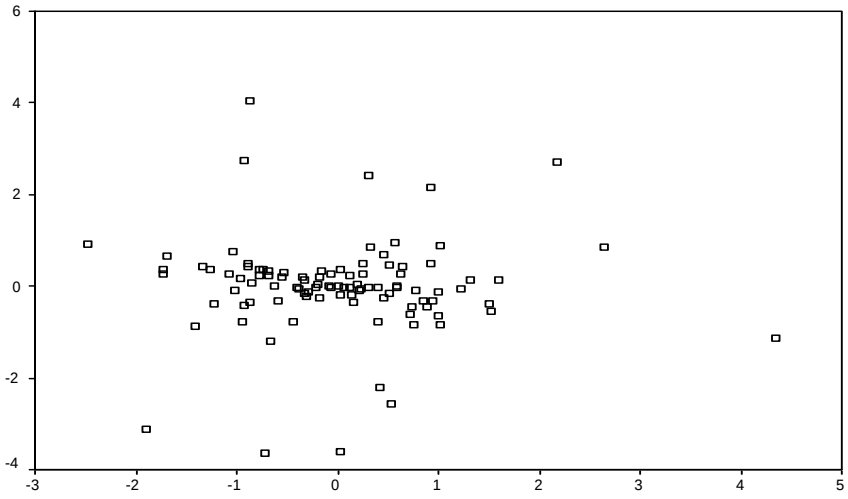

Figure 2: Students Removing Residual - Standardized Predicted Scatter

The figure 2 is a predicted value plot of a student removing residual –standardized. The vertical axis is the student removing residuals and the abscissa is the standard predictive value. The points of the figure 2 were up and down uniform distribution in the zero point of the vertical axis corresponds the straight line. Therefore the variance homogeneity assumption was founded.

3. CONCLUSIONS

The Shanghai Stock Exchange issued China's first the stock market report in 2006.The market quality attracts the domestic and international many aspects. The low transaction costs, the high liquidity, a reasonable offering price and the low stock market volatility are the stock market goal. The investment income is also an important reflection of the market quality. It is important to improve the market quality and efficiency to organizers and it is necessary to have a reference to the investors and the regulators to establish the relationship of the investment income and the market quality.

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