

# Statistical Analysis of Securities Comments used by Investors

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**Abstract** – This article analyzes the effect of Chinese securities comments from an entire new perspective by establishing SEM model with PLS algorithm based on investor questionnaire. The major issues that exist in Chinese current securities comment can be grouped into the following aspects: although investor does not satisfy with securities comments, they are still affected by it. In the meantime, it is not work well on the subject information supplied by securities analyst, independence and objectivity of analyst, and predictive validity of securities comment.

**Keywords:** Securities analysts; Conflict of Interest; SEM; PLS algorithm

## 1. Introduction

Securities comments are an important way to retail investors for gathering information. The efficiency of securities comments is becoming the most concern to investors. Securities comments can be spread from television, newspapers, radio, Internet and other free-charged way. Ordinary investors can make investment decision through immediately comment information on the securities from various media channels. They have a dilemma to love or hate the stock comments because it has two sides. On the one hand, investors can conveniently obtain professional information security consulting and investment, which for their own investment decision-making; the other hand, they might lose money for listening to securities comments in the stock market stuck and blame the securities comments for misleading.

In 2009, an investor survey made by Shenzhen Stock Exchange found that nearly 1 / 3 investors the trust what stock analysts said and take their views as a decision-making foundation [1]. According to the survey, there is 49.2% investors' information source coming from stock analysts. This Data indicate that media have a huge impact on investment decisions and access to information for investors. But at the same time, investors hold mood of suspicion and criticism on securities. In the same year, a network poll[2], 40% of investors do not believe stock analysts 57.1% think most of stock analysts are liar. Investors are still put low evaluation on stock analysts.

According to the study of Michael S. Drake, analysts tend to positively recommend stocks with high growth, high accruals, and low book-to-market ratios, despite these variables having a negative association with future returns[3]. Analysts' incentives to obtain investment banking business and to generate trading commissions are potential explanations for why they tend to over-recommend these stocks[4-5]

How Securities comments play the role of the investors and how investors use the securities comment? Can Securities comments provide services to common investor? Are they satisfied with securities comments? This paper attempts to make statistical empirical analysis in the form of a questionnaire survey on the effects of securities comments as the investor's point of view.

## 2. Research programs and questionnaire design

Select four stock exchange business departments in Shanghai as the samples randomly based on the method of the field questionnaire survey. The questionnaires are distributed and taken back after being filled in the researcher's presence during May and June, 2010. Survey questionnaire consists of two parts: (1) the basic situation of the respondents include: investors in the stock market investment of time, education, exposure to the way stock analysts and the stock analysts overall satisfaction; (2) the specific content of stock analysts which include the policy side, the macro side, the industry side, companies face, the message of education and information for investors. The survey applies the closed questionnaire and evaluates the specific contents of the securities comments by the measure scale of the Five Levels of Likert Scale based on the designed questions.

The sample size of this survey is defined by the measure of the sample size selected randomly, using formula  $n = Z^2 \sigma^2 / d^2$ . Here, n means the required number of the sample; Z means the statistic of Z at the confidence level;  $\sigma$  means the overall standard deviation; d means 1/2 of the confidence interval or the allowable error or the survey error in the practical application. Based on the trial of the questionnaire, the overall standard deviation of this research is estimated as 0.23, the confidence level of 95% and the sample error less than 2.5%, which are substituted into the formula with  $Z = 1.96$  to reach the minimum sample size of the questionnaire as 325. After the definition of the sample size, 420 pieces of questionnaires were distributed, 387 of which were returned. And the total number of valid return was 330 and the valid return rate was 78.57% which is larger than 70% [6], so it is conform to the minimum sample size and does not violate the principle of random selection.

## 3. Empirical analysis

### 3.1. Stock investors' information channels

From the survey, newspapers, television, Internet are most popular media channels for ordinary shareholders to

receive stock information, together accounted for 90.33%. In Which newspapers accounted for 38.97%, newspapers are still important medium investors gathering information; television accounted for 22.66%, network accounted for 28.70%, which channel is also constitute an important of power with the popularity of the network to spread. (See Table 1)

Table 1 Stock investors' information channels

	Newspaper	Television	Internet	Radio	Others	Total
Frequency	129	75	95	14	18	331
Percentage	38.97%	22.66%	28.70%	4.23%	5.44%	100.00%

3.2. Respondents' basic situation on using stock analysts

From the respondents' point of view, stock analysts as the role of information channels is greater than the role as a basis for decision making. Stock market investors obtain marketing information and financial information mean are 3.16 and 3.06, respectively, as a basis for stock picking and trading operations are 4.05 and 4.14, which indicate that investors in general are sometimes used stock analysts information, occasionally makes decisions according to stock analysts. It reflects investors' distrust of securities comment as a reference for decision-making. (See Table 2)

Table 2 Respondents' basic situation on using stock analysts

By stock analysts:	Always		Regular		Sometimes		Occasionally		Never (5)		Mean
	Counting	row %	Counting	row %	Counting	row %	Counting	row %	Counting	row %	
Access to stock market information	25	7.55%	76	22.96%	96	29.00%	89	26.89%	45	13.60%	3.16
Gathering financial information	9	2.72%	96	29.00%	127	38.37%	63	19.03%	36	10.88%	3.06
As a basis for stock picking	2	0.60%	28	8.46%	56	16.92%	110	33.23%	135	40.79%	4.05
As a basis for trading operation	5	1.51%	18	5.44%	55	16.62%	101	30.51%	152	45.92%	4.14

Table 3 Variable setting of intrinsic relationship of stock analysts

Latent variable	Measurable variable	Mean
Audience use ( $\eta_1$ )	Access to stock market information ( $y_1$ )	3.16
	Gathering financial information ( $y_2$ )	3.06
	Taking stock analysts as a basis for stock picking ( $y_3$ )	4.05
	Taking stock analysts as a basis for trading operation ( $y_4$ )	4.14
Stock comments' contents ( $\xi_1$ )	Macroeconomic fundamentals ( $x_1$ )	2.96
	Industry analysis ( $x_2$ )	3.13
	Individual stocks analysis ( $x_3$ )	3.44
	News and the financial side ( $x_4$ )	3.27
	Investor Education ( $x_5$ )	3.40
Stock comments' analyst ( $\xi_2$ )	professional ethics ( $x_6$ )	3.36
	professional performances ( $x_7$ )	3.06
	Objectivity and Independence ( $x_8$ )	3.40
	Quality of Individual opinions ( $x_9$ )	3.27
	Reputation or credibility of stock analysts ( $x_{10}$ )	3.53

3.3. Intrinsic relationship of stock analysts

The using of securities are primarily on decision-making and information-receiving. This paper uses four issues to reflect the audience of stock analysts. There are two direct effects on audience experience on the use of securities comments—quality of review content and quality of analysts. Securities comments reflect thoughts and ideas of the analyst, which imply the motivation and purpose of securities analysts, so there is a direct correlation between analysts' comment and analysts' attitude. In this paper, Five questions are used to measure analysts' comment and Five questions are used to analysts' attitude. structural equation modeling is used in this analysis.( Variable setting see table 3)

The general form of structural equation model as follows [7]:

Structural equation:

$$\eta = B\eta + \Gamma\xi + \zeta \tag{1}$$

Measurement equation:

$$X = \Lambda_x\xi + \delta, \quad Y = \Lambda_y\eta + \varepsilon \tag{Formula 2}$$

Which,  $\eta$  is the endogenous latent variables,  $\xi$  is the exogenous latent variables, X, Y can be measured for the corresponding variable, B is the endogenous latent variable coefficient matrix,  $\Gamma$  is an exogenous latent variable coefficient matrix,  $\Lambda_x$  for the measurable variables X in  $\xi$  on the factor loading matrix,  $\Lambda_y$  for the measurable variable Y in the factor loading matrix  $\eta$ ,  $\zeta$ ,  $\delta$ ,  $\varepsilon$  is a random disturbance term of their equation.

For this article the structural equation model, the specific path set as follows:

Structural equation:

$$\eta_1 = \begin{bmatrix} \gamma_{11} \\ \gamma_{21} \end{bmatrix} \begin{bmatrix} \xi_1 \\ \xi_2 \end{bmatrix} + \begin{bmatrix} \zeta_{11} \\ \zeta_{21} \end{bmatrix} \quad (3)$$

Measurement equation:

$$\begin{bmatrix} x_1 & x_2 & \dots & x_{10} \end{bmatrix}^T = \begin{bmatrix} \lambda_1 & \lambda_2 & \dots & \lambda_5 & 0 & 0 & \dots & 0 \\ 0 & 0 & \dots & 0 & \lambda_6 & \lambda_7 & \dots & \lambda_{10} \end{bmatrix}^T \begin{bmatrix} \xi_1 \\ \xi_2 \end{bmatrix} + \begin{bmatrix} \delta_1 & \delta_2 & \dots & \delta_{10} \end{bmatrix}^T \quad (4)$$

$$\begin{bmatrix} y_1 & y_2 & y_3 & y_4 \end{bmatrix}^T = \begin{bmatrix} \lambda_{11} & \lambda_{12} & \lambda_{13} & \lambda_{14} \end{bmatrix}^T \eta_1 + \begin{bmatrix} \varepsilon_1 & \varepsilon_2 & \varepsilon_3 & \varepsilon_4 \end{bmatrix}^T \quad (5)$$

According to the T identification rules of model, when the following conditions are met, the model can accurately identify [8]:

$$t \leq \frac{1}{2}(p+q)(p+q+1) \quad (6)$$

Where t is the number of parameters to be estimated, here t = 36, p is the number of endogenous variables which can be measured, q is the number of exogenous variables which can be measured, the right inequality is equal to 105, 36 < 105, the model can be identified.

Here, generalized least squares method is used to estimate the model parameters, after several amendments of the model, the final test results of evaluating this model are as follows:

Table 4 Regression Weights: Default model

			Estimate	S.E.	C.R.	P
$\eta_1$	<---	$\xi$	0.493	0.109	4.516	***
$\eta_1$	<---	$\xi$	0.311	0.109	2.858	0.004
$x_5$	<---	$\xi$	1			

Table 5 Model fitting results

Fit index	Absolute index					Relative index		Sample size
	$\chi^2 / df$	GFI	AGFI	RMR	RMSEA	NFI	CFI	Hoelter(0.05)
The actual test values	3.174	0.905	0.856	0.074	0.081	0.649	0.719	331
Theoretical optimal value[10]	<3	>0.9	>0.9	<0.08	<0.1	>0.9	>0.9	135

The model can be expressed by the model map and fitting results can be represented in a standardized path diagram (Figure 1). Path coefficient reflects the degree of influence between variables and direction of standardized path coefficient reflects the correlation between variables.

From a structural equation path diagram, you can clearly see the relations between latent variables and path variables can be measured load factor. Therefore, the intrinsic relationship between the variables can be evaluated.

According to the structural relationship between the latent variables, stock analysts on the impact of stock analysts factor content was 0.68, which indicate a degree

			Estimate	S.E.	C.R.	P
$x_4$	<---	$\xi$	1.029	0.085	12.069	***
$x_3$	<---	$\xi$	1.003	0.082	12.301	***
$x_2$	<---	$\xi$	0.983	0.099	9.954	***
$x_1$	<---	$\xi$	0.912	0.099	9.243	***
$x_{10}$	<---	$\xi$	1			
$x_9$	<---	$\xi$	1.185	0.1	11.886	***
$x_8$	<---	$\xi$	1.294	0.101	12.812	***
$x_7$	<---	$\xi$	0.962	0.101	9.55	***
$x_6$	<---	$\xi$	1.062	0.092	11.596	***
$y_1$	<---	$\eta$	1			
$y_2$	<---	$\eta$	0.705	0.076	9.243	***
$y_3$	<---	$\eta$	1.059	0.137	7.73	***
$y_4$	<---	$\eta$	0.898	0.126	7.148	***
*** Indicates P value less than 0.001						

Estimation of the model parameters need to be examined whether the results are statistically significant. Table 4 is the load factor for the path coefficients or significance test. The null hypothesis of path coefficients equal zero. AMOS provides the CR test statistic using the parameter estimates and their standard deviation ratio, while with probability P given, According to this test, all paths of P values pass the test at 0.05 level of confidence.

In the 0.05 confidence level, the minimum sample size of Hoelter test for the model is 135. The model fit the sample size requirement. It show that the basic theoretical absolute fit index close to the optimal value (Table 5). In general, the model is within the acceptable range. It should be noted that, in the structural equation model, the fit index cannot be established as the sole basis because the model is to examine the role of theoretical models and the adaptation of the data[9].

of between correlation. It is consistent with the actual situation. Stock analysts content directly come from stock analysts. Analysts' intentions have obvious impact on comment. The impact factor Stock analysts content on the audience is 0.48. In certain sense, this reflects the quality of the content cannot meet the needs of the audience use. Stock analysts' comments have a direct impact on the audience, the path coefficient is 0.28, which reflects the audience does not trust analyst. But there is still some degree of influence on overall impact of stock analysts to the audience. Besides stock analysts comments have a direct impact on the audience, there is indirect impact on the audience from stock analysts' content. Therefore, the

total effect of stock analysts on the impact of the audience is equal to 0.61. (direct effect + indirect effect  $0.28 + 0.68 \times 0.48$ ) This is consistent with the actual situation. Stock analysts generally have an impact on investors by their comment content, but analysts have less direct impact on the audience by themselves.

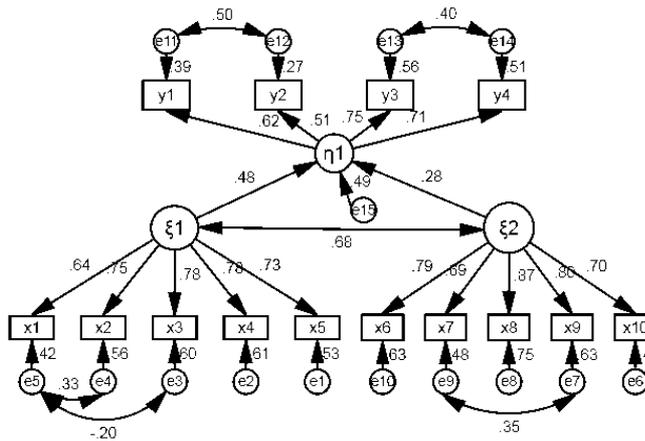


Figure 1 standardized path diagram

Considering the load factor of measurement equation, the coefficients of the model can reflect characteristics of the evaluation current stock analysts' comments. From the investor uses' point of view, although investors has a low opinion of using stock comments as their decision base, the actual use of stock analysts' comments are by investors are more sensitive and its' impact is 0.75. Similarly, investors are sensitive to the use of stock comments as their own trading operations, the correlation coefficient is equal to 0.71. This reflects susceptible impact to investors by stock analysts' comments. So when stock analysts appear false or misleading, investors tend to blame for stock comments' misleading. In contrast, although the investors' evaluation on observed indicators ( $y_1, y_2$ ) is better than the evaluation of ( $y_3, y_4$ ), the impact of sensitivity to the stock market information and financial information are only 0.62 and 0.51. The reason of this might be that subjective information for investors are more sensitive than objective information. It reflects the a tendency of investors to pay more attention to subjective information. On the basis of observed factors on stock comments' contents, Individual stocks analysis ( $x_3$ ) and News and the financial side ( $x_4$ ) have larger impacts, which equal 0.78. This reflects that Chinese investors intend to focus on technical analysis and news. The two factors' influence are more sensitive to the content of stock comments' contents. On the contrary, in chinese "policy market", Macroeconomic fundamentals ( $x_1$ ) the smallest of the five factors. the path coefficient is 0.64.

From observations factors on stock comments' analyst, analysts' objectivity and independence ( $x_8$ ) is the highest degree of influence, the correlation coefficient is equal to 0.87. This reflects investors' most concerned is the characteristics of analysts of objectivity and independence. Second, Quality of Individual opinions ( $x_9$ ), the correlation coefficient is equal to 0.8, then the analyst's professional

ethics ( $x_6$ ), the correlation coefficient equal 0.79; Reputation or credibility of stock analysts ( $x_{10}$ ) and professional performances ( $x_7$ ) is 0.7 and 0.69.

#### 4. Conclusion

4.1. Although investors are dissatisfied with stock analysts' comments, They are still vulnerable to the impact of comments.

Stock comments as a decision-making functions are relatively weak to ordinary investors. The evaluation of the stock comments reflects investors mistrust to analysts. Meanwhile, investors are dissatisfied with content of analysis and investor education content. Analyst's reputation or credibility and their objectivity or independence are considered relatively poor. Overall, the negative evaluation of stock comments is in the majority.

At the same time, investors are still subject to the impact of stock analysts' comments. Through structural equation modeling analysis, it shows that the total impact of stock analysts to investors are still high, in which effect directly affection from the stock contents is than analysts' affection. The total effect of superposition reached a certain influence. In addition, investors' evaluations on decision base functions of stock comments are low, but the actual uses by investors are still sensitive to the impact of it.

4.2. Investors pay more attention to stock analysts subjective information, but its evaluation is not high

Relative to Securities News, Comments provide the analyst's subjective point of view. From this overall assessment of the intrinsic relationship between stock analysts structural equation path load analysis, there is a tendency to investors that they place more emphasis on subjective information. The major impacts that analysts have influence on investors are subjective judgments such as stock analysts' recommendation or prediction. Subjective information are also the most controversial issue to investors. In the specific content of the evaluation of stock comments, evaluation of subjective information is lower than objective information and forecast information is lower than describe information. This reflects the subjective content cannot meet the needs of the audience.

4.3. Investors are most concerned about the objectivity and independence of analysts, but this evaluation is not high

Stock analysis content reflects analysts' thought. In profound level, it imply stock analysis, objectivity and independence of analyst. From this paper, the structural equation model of the overall evaluation of the intrinsic relationship shows the most characteristic of analysts investor focus is analysts' objectivity and independence. But the evaluations of these characteristic are also poor. Analyst's objectivity and independence has a direct relationship with analysts' motivation, which might lead to conflict of interest. In reality, there are some analysts who have the motives and conflicts of interest with illegal acts

which mislead investors. This make investors keep skeptical attitude to analysts' comment content. The phenomenon existed in stock analysts worth further exploring.

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