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An examination of stock market performance in China using accounting information

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ABSTRACT

This study aims to examine the usefulness of China accounting information in reflecting the stock returns in China stock markets and to recognize the significant factors that are possibly related to the stock returns in A shares and B shares respectively. Peoples' Republic of China accounting standard (PRC accounting standard) is used for A shares whereas International Accounting Standard (IAS) is used for B shares. By comparing the two accounting standards, we found that the definition of some items and concepts of the financial statements are different. Consequently, the values of the financial ratios are varied. In order to recognize the significant factors in A shares and B shares, the means of factor analysis was adopted to sort out important factors from a large number of financial ratios. For A shares, profitability, interest efficiency, liquidity, asset efficiency and earning power are found to be significant factors. While for B shares, the significant factors are profitability, asset efficiency, liquidity, operating efficiency and earning on interest expense. After running the regression with A shares daily returns and B shares daily returns to their respective significant factors, profitability, asset efficiency and earning power are found to be significant at 5% level in A shares and only profitability is found to be significant at 1% level for B shares.

LINGNAN COLLEGE

AN EXAMINATION OF STOCK MARKET PERFORMANCE IN CHINA USING ACCOUNTING INFORMATION

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CHAPTER 1 INTRODUCTION

1.1 Background

After 1970's economic reforms were carried out in China. These reforms led to a fast economic development, especially in the securities markets. Before 1970's, local businesses have been owned by the government and the government did not allow foreign capitals to invest in China. Until 1970's, some privately owned enterprises were established. So, Chinese citizens began to set up their businesses. In 1980's, some of them started to issue their corporations' shares to the public. In the late of 1990, Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE) were established and provided official places for stock exchange. Firstly, only local people were allowed to trade in the securities markets. Foreign capitals were allowed to invest in China until the appearing of B shares. B shares were first issued in the SHSE on 21 February 1992 and in the SZSE on 10 December 1991 (Chan 1997).

As in 1997, SHSE and SZSE had more than 600 listed companies in the securities markets and the average daily trade volumes were more than 100 billion Renminbi.

Investors all over the world were aware of the fast development of China's securities markets. For the convenience of investment, they would like to learn more about the nature and characteristics on this potential market.

Some listed companies in China like that in other countries have issued A shares and B shares, but they are different in their nature. Usually A shares and B shares in other countries are common stocks for all investors. However, in China A shares are limited to local investors (citizens of China) and B shares are limited to foreign investors. As a result, both markets are segmented and their prices are different (Poon et al. 1998).

Since A shares and B shares served different investors (prior is for local citizens and the later is for foreigners), both shares are using different accounting standards in preparing the financial statements. A shares are using People's Republic of China accounting standards (PRC) while B shares are using International Accounting Standards (IAS). Thus, listed companies in China need to prepare different sets of financial statements when they have issued both A shares and B shares. Therefore, investors will receive different information from A shares and B shares financial statements, such as accounting ratios, even they refer to the same company. They may also find that different factors will affect the performance of a company when comparing A shares and B shares financial statements.

1.2 Rationale

We focus our study on China because China is a fast developing country whose economy continues to grow rapidly. Many foreign investors are willing to do trade and investment in China, especially in Shanghai and Shenzhen as their economic environments are stronger and more favorable than other cities in China. However, financial environment and accounting system in China are totally different from western countries. Therefore, to become a rational investor, it is mandatory to recognize the discrepancies before entering into the China market.

And, we adopt on financial statements analysis in our study for the reason that financial statements are valuable in revealing the healthiness of a firm (Higgins, 1995). However, some may disputed that financial statements are useless. Since some accountants may deliberately make a firm's profit look more favorable by "window-dressing", that is by using different accounting procedures, like changing their accounting period or inventory valuation. Thus, they claimed that financial statements (or financial ratios more specifically) are not reliable to foresee stock returns. Therefore, they turn to use other means to predict stock returns such as Capital Asset Pricing Model (CAPM).

In our point of view, financial statements are useful in some circumstances as accountants put effort and time in preparing them. Besides, all items in the financial statements are obtained from a firm's actual operation. Thus, we believe that financial statements can reflect the performance of a firm. In view of this, it is constructive to examine the usefulness of accounting information (in terms of financial ratios) in reflecting stock returns in China stock markets.

Furthermore, we are also interested in examining the important factors (ratios) that can be used to appraise a company's stock returns in China stock markets. We believe that this handy information is very useful for investors to assess a company's performance. However, as we are aware of China has different formats of financial statements in A shares and B shares in China, we speculate that different factors will be at work in A shares (in PRC accounting standard) and B shares (in IAS).

1.3 Objectives

Based on the above rationale, the two objectives of our research are: to examine the usefulness of China accounting information in reflecting the stock returns in China stock markets (A shares and B shares). And, to recognize the significant factors that can mainly

related to the stock returns in A shares and B shares respectively.

In order to achieve the above objectives, we must first understand the differences between PRC accounting standard and IAS, together with the nature and characteristics of A shares and B shares in China stock market.

CHPATER 2 LITERATURE REVIEW

2.1 Background of China's stock market

Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE) were established in 1990. Like other countries, listed companies in China issue A shares and B shares. However, the characteristics of the two types of shares are totally different. A shares are limited to China citizens in Renminbi and their financial reports are based on PRC accounting standards whereas B shares are limited to foreign investors in Hong Kong Dollar or US Dollar and their financial reports are based on IAS (Tang et al. 1996).

Shareholders of both A and B shares have the same rights such as receiving the same dividend in different currencies (Poon et al. 1998). However, A shares are used to finance capitals from local investors and B shares are used to attract foreign investments to local stock markets. As foreign capitals are collected to develop local enterprises, B shares help China to develop open stock markets. The stock market of B shares continues to develop steadily. Until 27 June 1997, there were 93 B shares in Shanghai and Shenzhen Stock Exchanges (Chan 1997), where Shanghai had 45 shares and Shenzhen had 48 shares. The expansion of

B shares' market provides long term capitals for local enterprises. Also, the competitive power of China's companies has been enlarged.

2.2 Accounting System in China

China is one of the socialist countries in the world after 1949. Her political background is totally different from Western countries. With the influence of Russia and Marxism, China's political and economical systems were deeply affected by them (Tang et al. 1996).

The Soviet-style system of accounting was used from 1949 to the 80's (Davidson et al. 1995). However, the Government in China proposed to reform the economic structure and announced the "open-door policy" after 1979, which allowed more foreign investment to come in. Thus, the Soviet-accounting system was not practical after the 80's as the system was totally different from the western countries. This made a barrier for foreign investors to invest in China.

In order to cope with this problem, China reformed her accounting system on 1 July 1993. China released her first accounting standards, The Accounting Standards for Business

Enterprises (ASBE), to all Chinese business enterprises. Nonetheless, ASBE essentially comprise a conceptual framework rather than operational standards, thus they are expected to serve as a guide for formulating the detailed accounting standards. In February 1993, the Ministry of Finance of China started a three-year project to formulate detailed accounting standards. The end result of the project will be an enactment of 30 detailed accounting standards that are expected to be applicable to all enterprises in China. These proposed detailed accounting standards would move China's accounting practice closer to IAS than have ASBE. Notwithstanding, differences still exist between the detailed standards and IAS. For example, China's proposed detailed standards contain accounting rules on liquidation, which are not present in IAS (Xiang 1998).

Although China accounting system continues to reform to become more standardized with the International Accounting Standard (IAS), her unique historical, cultural and economic background made their accounting system distinctive (Davidson et al. 1995; Tang et al. 1996;).

The major differences among PRC accounting standards and IAS are the objectives and users of accounting information (Davidson et al. 1995). The Chinese Government has significant role on both state-owned enterprises and private sector enterprises. Therefore,

the Government is the most principle user of accounting information in China. In addition to this, various types of enterprises need to prepare financial statements for various government agencies. However, in western countries, the main users of accounting information are creditors of financial institutions or investors.

Furthermore, there are three traditional bases of accounting system in China accounting regime, which are varied from that in western countries. They are: Fund-based, Rule-based and Tax-based (Davidson et al. 1995; Waterhouse, 1998). In the centrally planned economy, Fund-based system stated that funds are allocated to the state-owned enterprises for a specific purpose, such as the purchase of fixed assets or the payment of suppliers and may not be used for other purposes. The fund-based system was designed to facilitate central control and the implementation of economic policy. It was difficult to identify an individual enterprise's performance in terms of profit. Rule-based system stated that all accounting rules in China are set centrally and organizations are required to follow them strictly. Professionals are limited to make judgement in PRC accounting standards. In contrast, IAS is principle-based where the management of the individual company has to use judgement in applying the principles so as to ensure that the accounts present a true and fair view. Tax-based system stated that the profit reported in the accounts of Chinese enterprises are used to compute tax payments (Waterhouse, 1998). For this reason, under the

traditional accounting system there was no flexibility in the amount of provisions to be made against assets or the depreciation lives of fixed assets. On the contrary, western countries have separate preparation of accounting and taxation.

Besides, the general accounting concepts between PRC & IAS are slightly different. Going concern, business entities, accounting period and money measurement are the fundamental accounting concepts in PRC. For IAS, going concern, consistency and accrual are the fundamental principles (Tohmatus, 1996). Nevertheless, there are some similarities between PRC & IAS, like general principles of prudence and materiality. Table 2.2.1 shows the general comparison and degree of differences between PRC accounting standards and IAS.

Table 2.2.1 Comparison of Chinese and International Accounting Standards

Item	International Accounting Standards (IAS)	Chinese Accounting Standards for Business Enterprises (PRC)	Differences
General Accounting Concepts			
1) Truth, correctness, completeness and timeliness	All accounting records must be prepared and recorded according to the actual economic transactions that took place. The accounting records should be complete, accurate and prepared on a timely basis.	Similar to IAS but the rule may conflict with the general principles in certain circumstances. For example: certain contingencies and commitments items may be omitted.	*
2) Consistency	The accounting policies and methods adopted by an enterprise should be consistently applied throughout the accounting years.	Same as IAS	–
3) Accrual basis	Accounts should be kept on the accrual basis.	Same as IAS	–
4) Matching of income and expenditure	Income and all related costs and expenses should be matched in the same accounting period.	Same as IAS, but in some areas are very rigid: e.g. capital expenditure and pre-operating expenses.	**
5) Capital expenditure Vs revenue expenditure	Capital expenditure should be distinguished from revenue expenditure. Different accounting treatments should be applied to these two types of expenditures.	Same as IAS but subject to rigid rules.	*

Fixed Assets 1) Fixed asset capitalization	Per company policy, general capitalized assets to be used more than one accounting period, have limited useful life and owned by the enterprises for producing goods or services.	Capitalized assets refer to the assets whose useful life is over one year, and non-operating equipment with over two year useful life. They would be capitalized with a prescribed unit value RMB2, 000.	***
2) Cost of fixed assets	Historical cost (purchase price plus taxes, freight and handling charges). Revaluation allowed as alternative.	Same as IAS. Revaluation not allowed except with the approval of State laws or regulations.	2) **
Depreciation 1) Depreciable amount & Depreciable method	Historical cost less estimated residual value (or based on valuation). A number of methods utilized. Generally straight line and accelerated depreciation methods are acceptable.	Same as IAS. Generally straight-line method is used. If approved, accelerated depreciation method may be adopted.	*
2) Amortization	Over the period estimated to be benefit. Normally not exceed 40 years.	Starting from the day of being used, amortized periodically within the time specified by regulation. If not specified, amortization period based on the expected life of service or within a period of no less than 10 years.	****
Bad Debt 1) Provision for bad debts	Provision for bad debts and charge against income when certain amount is estimated to be uncollectible. Provision can be specific or general or a combination of both.	Provision up to 3%-5% of the total receivable is allowable. Provision must be shown separately on the balance sheet as a deduction from debtors.	****
Investment 1) Current Investment	Cost less provisions or mark to market.	Carried at acquisition cost. Valuation methods such as market value or lower of cost and market value are not permitted.	****

2) Long-term Investment	Generally longer than one year, record at historical cost (original purchase price). Reserve against the carrying amount to recognize impairment other than temporary.	Same principle except no provision for impairment.	*
Inventory			
1) Valuation of inventory	Lower of cost or net realizable value.	All inventories shall be accounted for at historical cost, but the provision for loss is subject to approval from appropriate authorities.	**
2) Inventory costing methods	Costing method includes FIFO, LIFO, weighted average cost, specific identification, and base stock.	Similar to IAS	–
3) Treatment for the loss of inventory	Any deterioration and damage of inventory should be accounted into the current profit and loss.	Same as IAS	–
Expense			
1) Cost and Expense	Matching concept	Same as IAS	–
Revenue			
1) Recognition of revenue	Recognize upon transfer of risks and towards ownership of the goods sold and upon provision of services.	Similar principle	–
2) Realization of cash receipts	Revenue is recognized only when goods are shipped or services are performed. If cash is received beforehand, the revenue is deferred until goods are shipped or services are rendered.	Similar principle.	–
Profit/Loss			
1) Distribution of profit	Normally via declaration of dividend per share	Proportional to each participant' s investment	–

		contribution.	
Others 1) Accounting year	Determined by entity.	Calendar year.	–
2) Audit	Performed by any CPA firm registered in the country concerned. Foreigners can register as CPAs if qualifications and experience criteria are satisfied.	Not mentioned.	–

Notes: -

*Asterisk * represents the degree of differences between PRC accounting standards and IAS. Five asterisks (*****) represent the highest degree of different while one asterisk (*) represent the smallest degree of different.*

Hyphens (-) stand for no different between PRC accounting standards and IAS.

2.3 Financial Statements Analysis and Ratio Analysis

Financial statements are one of the most important means to indicate the healthiness of a firm (Higgins, 1995). Usually, financial statements contain balance sheet, profit and loss account, statement of retained earning and statement of cash flow. In China, it also contains the financial status change statement. However, statement of cash flow is not compulsory (Tang et al. 1996).

Listed companies in SZSE and SHSE are required to prepare two sets of financial statements: one for the local A share investors which follows the PRC accounting standard,

and the other one for the foreign B share investors which follows the IAS (Waterhouse, 1998).

Under the China Securities Regulatory Commission (CSRC), listed companies in Shanghai and Shenzhen are required to follow the requirements regarding the form and content of the financial statements. Also, companies need to be aware of the disclosures in the footnotes, for example, reasons for significant differences from the previous year's balance, contingencies and subsequent events in the financial statements (Waterhouse, 1998).

According to White et al. (1997), supplementary data in financial statements like financial ratios were worthwhile to users in analyzing, assessing or comparing the companies' performance. It showed that there were some relations between accounting ratios and stock returns such as Price/ Earning ratio.

Since financial ratios are easy to compute and obtain from the financial reports, many professionals utilize financial ratios to predict the pricing behavior. A primary advantage of ratio analysis is that equity investors and creditors can be used to compare the risk and return relationships of firms of different sizes in order to help them make intelligent investment and credit decision. Ratios can provide a profile of a firm, its economic characteristics and competitive strategies, and its unique operating, financial, and investment characteristics

(White et al. 1997).

Connor (1995) concluded in his study that the fundamental factor model (ratios in financial statements) outperforms the statistical factor model (various maximum likelihood and principle components based) and macroeconomic factor model (factor affecting economy e.g. inflation rate and interest rate). The comparison of explanatory power is the only criterion by which to evaluate the relative worth of the three approaches.

Chan et al. (1998) evaluated the performance of fundamental factors, technical factors (past returns), macroeconomic factors and statistical factors in capturing the systematic covariation in stock returns. In his conclusion, he found that the performance of macroeconomic factors was quite disappointing. This factor did a poor job in explaining return covariation. Moreover, the explaining power of statistical factors was decreasing after two principle components. Besides, technical factors had not been extensively used because they generated large spread in return. Nonetheless, fundamental factors seem to be worked well in capturing the covariation in stock returns.

Barnes (1987) had examined the analysis and use of financial ratios. He presumed that financial ratios were almost used on predicatively, either implicitly or explicitly. They were

good indicators of a firm's financial and business performance and its characteristics. Also, they may be used to forecast future performance and characteristics.

Many accounting ratios can be derived from financial statement e.g. profitability, turnover and liquidity ratios. It is difficult for us to deal with so many ratios when we analyze a company's financial statements. Usually, it is more convenience and common to process several factors when making decision. Moreover, it is difficult and nearly impossible to formulate a multiple-regression between stock returns with all accounting ratios as problem of multicollineraity and heteroscedasticity will be arisen. Therefore, factor analysis is an instrument to solve the problem statistically.

Factor analysis is a useful statistical tool in reducing a large set of correlated variables into fewer unrelated dimensions and identifying a typology. It is able to summarize and reduce the large number of variables into smaller number of factors. So it is widely used in empirical research. According to Kline (1994), factor analysis referred to a set of closely related models intended for exploring or establishing correlation structure among the observed random variables.

Cheng (1995) had used factor analysis to identify a number of factors that affect the UK security returns. In his research, market factor and economic factor were identified. Besides, Short in 1980 had conducted a research to examine whether price-level adjustment will affect the relationships between accounting ratios:

> *Factor analysis is used here to sort a set of data pattern (i.e. correlation coefficients) into subsets, so that each subset contains data that are as similar as possible. These subsets are known as factors. Factors may be interpreted to show the underlying relationship of the items in each subset and inferences may be drawn about the conceptual dimensions that underlie the specific items.*

Roll and Ross (1980) used factor analysis to generate 4-5 factors in their Arbitrage Pricing Theory (APT). The APT formulated by them offers a testable alternative to the well-known capital asset pricing model (CAPM) introduced by Sharpe, Lintner and Mossin. Since the APT allow more than one generating factor related to the expected return, then Roll and Ross applied the factor analysis to generate those factors in their methodology.

Zeller et al. (1997) also made use of the factor analysis to generate six factors that were affecting hospital's performance. Financial ratios were the inputs of factor analysis.

Finally, six financial characteristics of performance were identified. They were profitability, fixed-asset efficiency, capital structure, fixed-asset age, working capital efficiency and liquidity. Thus, when looking at a hospital's financial statements, we could only emphasis on the above factors.

Also, Laitinen (1992) adopted factor analysis to generate three kinds of process to identify the degree of riskiness of a firm. Laitinen utilized financial ratios as inputs of factor analysis and using varimax rotated factor in factoring loading. The safe process showed that firms are having good initial profitability and having sufficient level of revenue. The grey process showed that firms are having poor initial values of financial ratios. However, they will not necessarily lead to failure provided that cash flow ratios can be kept stable and profitability is gradually improved. The risky process showed that firms are having poor financial ratios with a negative movement in time and do not have any possibility of surviving.

Short (1980) had conducted a similar research. The primary objective of the research is to examine whether price-level adjustment will affect the relationship between accounting ratios. He input 36 ratios from 259 firms by using factor analysis to sort out some important factors. As a result, seven factors had been generated from both historical ratios and

price-level ratios respectively. They were return, capital intensive, asset turnover, financing policy, inventory turnover, working capital and current position.

To sum up, it is convenience to use financial statements to oversee a company's performance. Using ratio analysis by the mean of factor analysis is a useful and handy tool to simplify a pool of data into several symbolic factors. Otherwise it is difficult for us to make good decision in front of an enormous numbers of ratios.

CHAPTER 3 RESEARCH DESIGN

3.1 Data Collection

Data of the daily closing prices of A shares and B shares and financial statements of all listed companies in China in 1995-96 was obtained from the Hong Kong branch of Taiwan Economic Journal (TEJ). Financial statements included balance sheets, profit/ loss statements, statements of retained earning, financial status change statements (for PRC accounting standard only) and statements of cash flow (for IAS only) were analyzed.

The companies we looked at in this study were: -

- Being listed on Shenzhen or Shanghai Stock Exchanges.
- Having issued both A shares and B shares so as to compare the differences among the IAS & PRC accounting systems together with the factors affecting their stock market performance.

The numbers of sample are 46 companies in our study (20 on the SZSE and 26 on the SHSE). The names, security codes, industry type and listing dates of these 46 companies are shown in Appendix 1 (Shenzhen) and Appendix 2 (Shanghai).

3.2 Methodology

Factor Analysis was used as a methodology in this study. It is a statistical technique used to identify a relatively small number of factors that can be used to represent relationship among sets of many interrelated variables. This methodology not only sorting out the large number of variable inputs into a certain number of factors, but also showing the degree of importance of each factor. Thus, we could find out the significant factors that are best to reflect the stock returns in A shares and B shares. According to Hair et al. (1995), the purpose of factor analysis is to group and reduce the financial ratios (i.e. variables / respondents) into smaller number. Then, we can generate a more precise picture about the factors affecting stock returns.

After that, we ran a regression to test the significance of those selected factors and test the relationship between factors and stock returns.

3.2.1 Factor Analysis

There are four steps in handling factor analysis after confirmed the objectives of factor analysis (Hair et al. 1995).

The first step was examining the correlation matrix. We obtained a 30 ratio's correlation matrix. Since one of the goals of factor analysis is to obtain factors that help to explain these correlation, the variables must be related to each other for the appropriate factor model. So, the correlation between ratios cannot be too small.

The second step was factor extraction. It extracted the number of factors, which is necessary to represent most of the data (ratios). We employed principal components analysis to obtain estimation of the initial factors. In principal components analysis, linear combinations of the observed variables are formed.

The third step was rotation. It focuses on transforming the factors to make them more interpretable. We exploited varimax method in our step of extraction because this method attempts to minimize the number of variables that have high loading on a factor. This should enhance the interpretability of the factors. Whereas quartimax and equamax have

shortcomings as they often result in a general factor with high-to-moderate loading on most variables. As a result, we decided the number of factors by looking at the total variance (which is explained by each factor from the column labeled as eigenvalue) or slope of scree plot.

The fourth step was obtaining factor scores. The scores for each factor can be computed for each case and then can be used in a variety of other analyses. In our study, the factor scores will be used in multiple regression to represent the independent variables.

3.2.2 Multiple Regression

Multiple regression is employed to study the relationship between factors derived from the factor analysis and stock returns.

We will use adjusted stock returns[1] as our dependent variables instead of using raw stock prices. It is because simply use the stock price may account of certain econometric problems such as non-stationary, heteroscedasticity or model misspecification than return models (Christie 1987; Barth et al. 1990 and Kothari and Zimmerman 1995;).

To calculate the returns, we made use of the daily returns of listed companies in SZSE and SHSE respectively. According to Tufano (1998), using daily return data, that is with higher frequency, is better than using weekly, monthly or quarterly return data to prevent the non-stationary problem. Further, based on Ma (1996), weekly market returns was outperform than the monthly market return because weekly market return will be more precise. Moreover, Kim (1997) reexamined that monthly returns are more significant than quarterly, semi-annually and annual returns. He found that monthly stock returns had more explanatory power than using quarterly stock returns. Therefore, based on their findings, we would use the daily stock returns as our dependent variables in order to prevent non-stationary problem and capture a more accurate picture.

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[1] Based on TEJ, Adjusted stock return (r_{it}) is calculated as:
$[P(t) - P(t-1) + D(t) + R(t) / P(t-1)]$ x 100 % , where r_{it} = adjusted stock return of firm i at day t P(t) = daily close in date t; P(t-1) = daily close in date t-1; D(t) = cash dividend per share in date t and R(t) = right's value per share in date t. However, returns are obviously correlated with activities of the firm like stock repurchases, stock splits, stock dividend, dividend and capital structure changes (Bartov 1989; Lakonishok & Lev 1987)

In addition, we used percentage change to calculate the returns to prevent the non-stationary problem (Barth et al. 1990). Further, we would apply geometric mean to annualize the returns instead of using arithmetic mean. This is because using arithmetic mean may arise bias when the rates of returns vary over the years. However, using geometric mean could capture the return more accurately. Thus, our annualized return is calculated as follow: -

$$R_{it} = \pi^{1/n} - 1$$

where R_{it} = annualized return of firm i at year t

π = $(HPR_1)(HPR_2)(HPR_3)....(HPR_N)$

HPRi = Holding Period Return

= $r_{it} / r_{it}-1$

r_{it} = adjusted return of firm i at day t

After obtained the stock returns and the key factors obtained from factor analysis. We then examined the relationship among them by running the regression model. Furthermore, we would run two sets of regression. They are A shares and B shares of China listed companies respectively. The regression equation is:

$$Rit = \alpha + \beta_1 F_1 + \beta_2 F_2 + \cdots\cdots\cdots + \beta_n F_n + \varepsilon it \qquad (3)$$

where R_{it} = stock returns of firm i at year t

α = coefficient of Y-intercept.

β_i = regression coefficients

F_i = financial ratio factor

ε_{it} = error term of firm i at time t

After running the regression, value of the Y-intercept coefficients, regression coefficients and error terms will be obtained. F-test and t-test are used to test the significance of the model and the coefficients.

CHAPTER 4 RESULTS AND ANALYSIS

4.1 Results of Factor Analysis

According to the results of factor analysis, we had obtained five factor variables in both Shenzhen's and Shanghai's A shares and B shares respectively. Five factor variables were chosen because the explaining power would decrease if we consider more than five factor variables. As shown in figure 4.1.1, A shares scree plot result and in figure 4.1.2, B shares screen plot result, the decreasing explaining power was indicated as the line was leveled off after five components numbers. Therefore, five factors were the most suitable number of variables in explaining both A shares and B shares.

Figure 4.1.1 Scree Plot for A shares

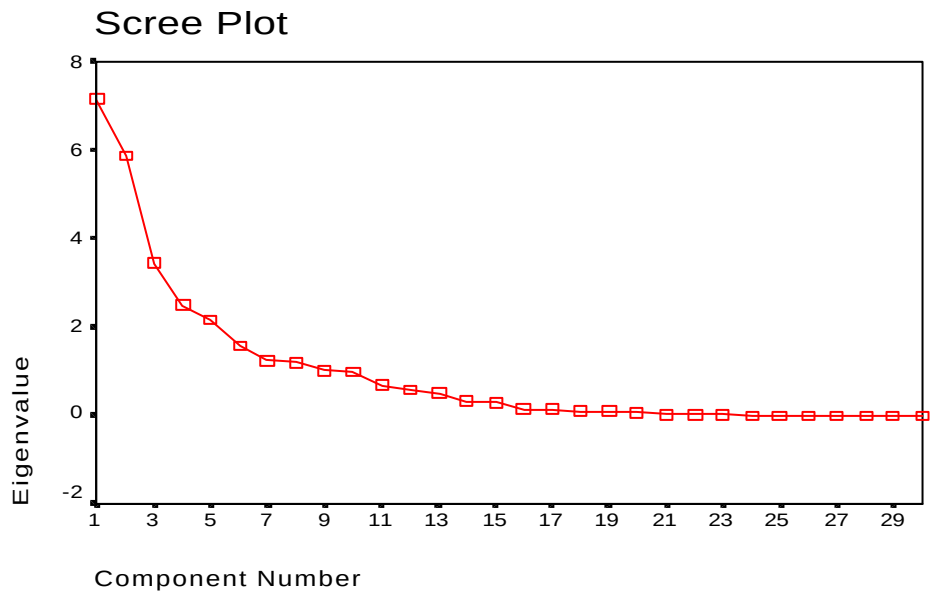
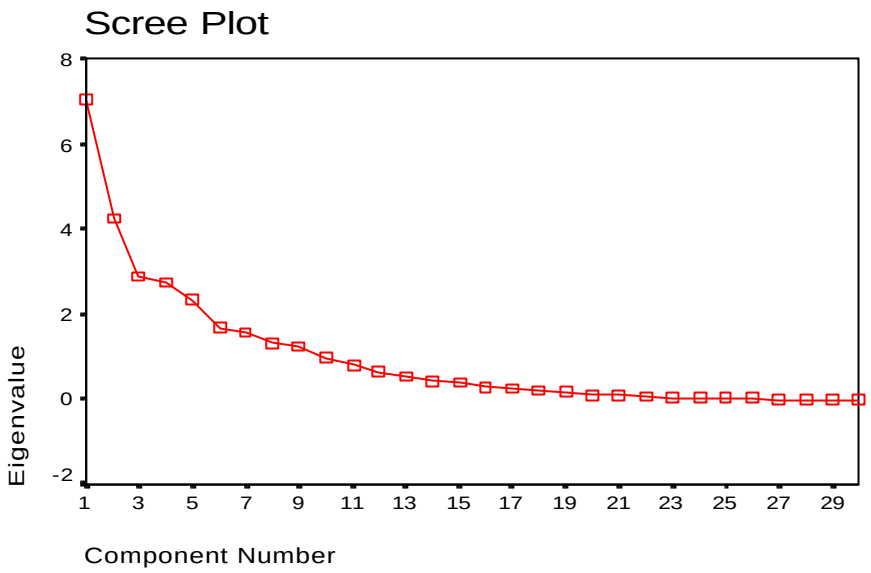


Figure 4.1.2 Scree Plot for B shares



In A shares result, those factors were named profitability ($FAC1_A$), interest efficiency ($FAC2_A$), liquidity ($FAC3_A$), asset efficiency ($FAC4_A$) and earning power ($FAC5_A$). While in B shares result, those factors were named profitability ($FAC1_B$), asset efficiency ($FAC2_B$), liquidity ($FAC3_B$), operating efficiency ($FAC4_B$) and earning on interest expense ($FAC5_B$). Factors in both A shares and B shares were not totally the same with each other. As we could see three factors were identical and others two were different in A shares and B shares result. This may because A shares and B shares in China are using different accounting principle, A shares are using PRC accounting standards and B shares are using IAS. Different accounting standards would affect the nature and number in financial statements and also the calculation of accounting ratios. Therefore, factor analysis would generate different factor variables according to different ratio inputs.

Factor variables were named according to their functions and characteristics. $FAC1_A$ and $FAC1_B$ were named together as profitability because its ratios were related between income and sales. They were explaining different type of income per sales and represent the ability of making profit of a company. Also, $FAC3_A$ and $FAC3_B$ were identified same as liquidity because they were related to cash flow, current liability and indicated the liquidity situation of a company. Moreover, $FAC4_A$ and $FAC2_B$ were also titled the same as asset efficiency. It is because most of their ratios were describing sales per assets. They seem to be related to the efficiency of total assets within a company.

However, $FAC2_A$, $FAC5_A$, $FAC4_B$ and $FAC5_B$ were named differently. $FAC2_A$ was identified as interest efficiency as most of its ratios were related between different type of income and interest expense. They seem to illustrate the capability of interest expense of a company. Also, $FAC5_A$ was titled earning power because its ratios were showing the relationship between income and asset or equity. It seems that they were looking at the earning power of different components of a company, not just only look at one component. On the other hand, $FAC4_B$ was named operating efficiency because its ratios were describing operating activity efficiency. Also, $FAC5_B$ was titled earning on interest expense as its ratios were picturing the relationship between income and interest expense. They seem

illustrating the earning power per interest expense of a company. More details of the content of the factors were shown in Table 4.1.1 and Table 4.1.2.

Table 4.1.1 Important Factors for A shares

Factor 1		**Profitability**
NI.NV	income as a %of net sales	net income/net sales
N.P.MAR	net profit margin	pretax income-income tax expense *100%/sales
PRO.MAR	profit margin	net income/sales
P.T.MAR	pretax margin	pretax income/sales
M.B.TAX	margin before tax	EBIT/sales
OPER. MAR	operating margin	operating income/sales
OP.EXP	operating expense	operating expense/net sales
Factor 2		**Interest Efficiency**
INT. COV	interest coverage	operating income/interest expense
INT. COV2	interest coverage 2	operating income/interest expense
TIME.IN.E	time interest earned	EBIT/interest expense
ROA	return on total assets	operating income/avg total assets
Factor 3		**Liquidity**
CAS.RAT	cash ratio	cash + marketable securities/current liabilities
QUK RAT	quick ratio	cash and cash equivalents/current liabilities
LIAB AST	liabilities to assets	total liabilities/total assets
CURT. RAT	current ratio	current assets/current liabilities
Factor 4		**Asset Efficiency**
FX. AST.T	fixed asset turnover	sales/avg total assets
TO. AST.U	total asset utilization	sales/avg total assets
STK. TURO	stock turnover	cost of good sold/avg stock
GR. MAR	gross margin	gross profit/sales
Factor 5		**Earning Power**
EPS	earning per share	
ROE	return on common equity	net income/avg total equity
P.IR.AST	price-interest return on asset	EBIT/avg total assets
FX.AST.U	fixed asset utilization	sales/ net fixed assets

Table 4.1.2 Important Factors for B shares

Factor 1		**Profitability**
P.T.MAR	pretax margin	pretax income/sales
N.P.MAR	net profit margin	pretax income-income tax expense *100%/sales
PRO.MAR	profit margin	net income/sales
M.B.TAX	margin before tax	EBIT/sales
EPS	earning per share	
ROE	return on common equity	net income/avg total equity
NI.NV	income as a %of net sales	net income/net sales
Factor 2		**Asset Efficiency**
FX.AST.T	fixed asset turnover	sales/avg total assets
TO.AST.U	total asset utilization	sales/avg total assets
P.IR.AST	price-interest return on asset	EBIT/avg total assets
LIAB.AST	liabilities to assets	total liabilities/total assets
Factor 3		**Liquidity**
QUK.RAT	quick ratio	cash and cash equivalents/current liabilities
CAS. RAT	cash ratio	cash + marketable securities/current liabilities
CURT.RAT	current ratio	current assets/current liabilities
Factor 4		**Operating Efficiency**
INV. TURO	inventory turnover	cost of goods sold/avg inventory
OP.EXP	operating expense	operating expense/net sales
STK.TURO	stock turnover	cost of good sold/avg stock
GR.MAR	gross margin	gross profit/sales
PE	price earning ratio	current stock price/eps
Factor 5		**Earning on Interest Expense**
INT.COV	interest coverage	operating income/interest expense
OPER.MAR	operating margin	operating income/sales
TIME.IN.E	time interest earned	EBIT/interest expense

4.2 Results of Regression

There is a linear relationship between dependent variables (stock returns of the firms) and independent variables (financial ratio factors) in A shares and B shares. Table 4.2.1 shows that the p-values of A shares and B shares are significant at the 5% level.

Table 4.2.1 P-value for A shares and B shares

	F value	**Significant**
Panel A : A shares	3.221	0.015
Panel B : B shares	2.913	0.025

Moreover, Table 4.2.2 shows that the regression models in A shares and B shares did not have the heteroscedasticity problem. According to the White's heteroscedasticity test, number of observation times R-square ($n*R^2$) is equal to 13.202 in A shares and 12.282 in B shares. The 5% critical chi-square value for 40 degree of freedom is 66.7659, the 10% critical value is 63.6907, and the 25% critical value is 59.3417. All these values are greater than the values of $n*R^2$.

Table 4.2.2 White Heteroscedasticity Test for the A shares and B shares

	Number of observations (n)	R Square (R^2)	$N*R^2$	Degree of freedom (df)	5% critical value	10% critical value	25% critical value
Panel A : A shares	46	0.287	13.202	40	66.7659	63.6907	59.3417
Panel B : B shares	46	0.267	12.282	40	66.7659	63.6907	59.3417

Table 4.2.3 shows that the coefficients of the model. It can be seen that there is no multicollinearity problem among the five factors in both A shares and B shares. This is because the values of Tolerance and VIF are 1.000 in both cases.

For A shares, three factors were significant at 5% level. They were profitability, asset efficiency and earning power. While for B shares, only one factor, profitability, was significant at 1% level.

Table 4.2.3 Coefficients of independent variables in A shares and B shares

	t-value	Significance	Tolerance	VIF
Panel A:				
A shares				
Factor 1 **(Profitability)**	2.526	0.016**	1.000	1.000
Factor 2 **(Interest Efficiency)**	0.451	0.655	1.000	1.000
Factor 3 **(Liquidity)**	-0.080	0.937	1.000	1.000
Factor 4 **(Asset Efficiency)**	-2.178	0.035**	1.000	1.000
Factor 5 **(Earning Power)**	2.185	0.035**	1.000	1.000

	t-value	Significance	Tolerance	VIF
Panel B:				
B shares				
Factor 1 **(Profitability)**	-3.599	0.001***	1.000	1.000
Factor 2 **(Asset Efficiency)**	-0.480	0.634	1.000	1.000
Factor 3 **(Liquidity)**	-0.032	0.973	1.000	1.000
Factor 4 **(Operating Efficiency)**	-0.021	0.983	1.000	1.000
Factor 5 **(Earning on Interest Expense)**	1.175	0.247	1.000	1.000

****, **, * denote statistical significance in 2-tailed test at 1%, 5% and 10% levels respectively.*

4.3 Underlying Reasons

Profitability is significant in both A shares' and B shares' regression. This may due to profitability is expected to be a common financial characteristic of a company, no matter the type of a company. If a firm, owing to poor profitability, is not able to earn sufficient amount of profit, soon afterward, it is forced to take more and more debt to survive. Eventually, the company would failure. If a firm can increase its profitability, it can pay its

financial obligation and sustain for a long time. Also, immense competitive and risky business environment will enhance a company to concentrate on its profitability. This is the only way for a company to increase its competitive power, even outperform than others. So, increase profitability has become a major mission of many companies.

Moreover, asset efficiency is significant in A shares' regression. This may because asset efficiency is a financial characteristic of capital intensive industry. Owing to the advanced technology, productivity not only depends on labor, but also depends on machine and other assets. Consequently, assets have become a major part for a company to operate effectively. It is profitable for a company to fully utilize its asset.

Furthermore, earning power is also significant in A shares' regression. This may because earning power indicate a company's assets and liability ability to increase revenue. It is logic to think that a company could make more profit and operate for long run with high earning power.

CHAPTER 5 CONCLUSION

In this study, five factor variables have been created by factor analysis for each A shares and B shares respectively. After running multiple regression with the stock returns of A shares and B shares and their five factors variables separately. The overall regressions of both shares were significant at 5% level. Also, no heteroscedasticity and no multicollinearity problem have been found in both regressions.

For A shares, three factor variables, namely profitability, liquidity and asset efficiency, are significant at 5% level. And the other two, that is interest efficiency and earning power, are not significant. While for B shares, profitability is the only one factor variable that is significant at 1% level, and other four factors are not significant. Different significant factor variables are found because of the different accounting standards used. PRC accounting standards is used in A shares and IAS is used in B shares. Since the rules and definition of some items in the accounting systems are different, the items' values and ratios calculated in financial statements are different even though the shares are issued by the same company. As a result, the number of factor variables and type of variables found are different.

Comparing the results with Zeller et al (1997), both of us were using financial ratios as input variables of factor analysis to examine company performance. However, his study generated six significant factors and only three factors were similar with our research, that is profitability, fixed asset efficiency and liquidity. Others three were different, namely capital structure, fixed-asset age and working capital efficiency. While we had interest efficiency, earning power and earning on interest expense. This may due to our selected companies' nature and sample size were different from his study. Zeller was focusing on hospitals and our study was focusing on all types of industry listed in SZSE and SHSE, mostly were in industrial type (see Appendix 3 for the distribution of industry type in Shenzhen and Shanghai respectively). Therefore, different types of industry may emphasis different significant factors in their financial statements.

Short (1980) also applied similar methodology in his research. He input 36 ratios to factor analysis and seven significant factors had been generated, which are return, capital intensive, asset turnover, financing policy, inventory turnover, working capital and current position. When compared with our research, return was similar to our profitability factor, asset turnover was similar to our asset efficiency and current position was similar to our liquidity. In addition, the above factors were also similar to the results of Zeller's research.

Thus, we can conclude that profitability, asset efficiency and liquidity were common factors in evaluating company performance.

In summary, profitability is the most significant and common factor in most of the studies. Investors can make use of the financial statements and pay attention to this common factor or its related financial ratios when evaluating a company' s performance in any types of industry.

CHAPTER 6 LIMITATIONS

There are several limitations in our study. First of all, the observation period is shorter than what we first planned. Initially, a four-year observation period (1994-1997) was planned. However, our data source, TEJ CD-ROM database, only contains the daily stock price updated to 7 October 1997. Thus, it is impossible to observe the stock returns for the last three months of 1997. Furthermore, we also found out that most of the companies have their financial statements in the year of 1995-1996 only and some of the firms setup their business in late of 1996. Thus, in order to compromise the above limitations, we finally shortened our observation period to the year of 1996 only.

In addition, the format of financial statements that TEJ Database provides is not in standard format. It just provides the values without any footnotes or notes to the account. Thus, it made us difficult to analyze the financial statements, as we would not gather enough information about the calculating methods, significant differences or adjustments that the companies applied.

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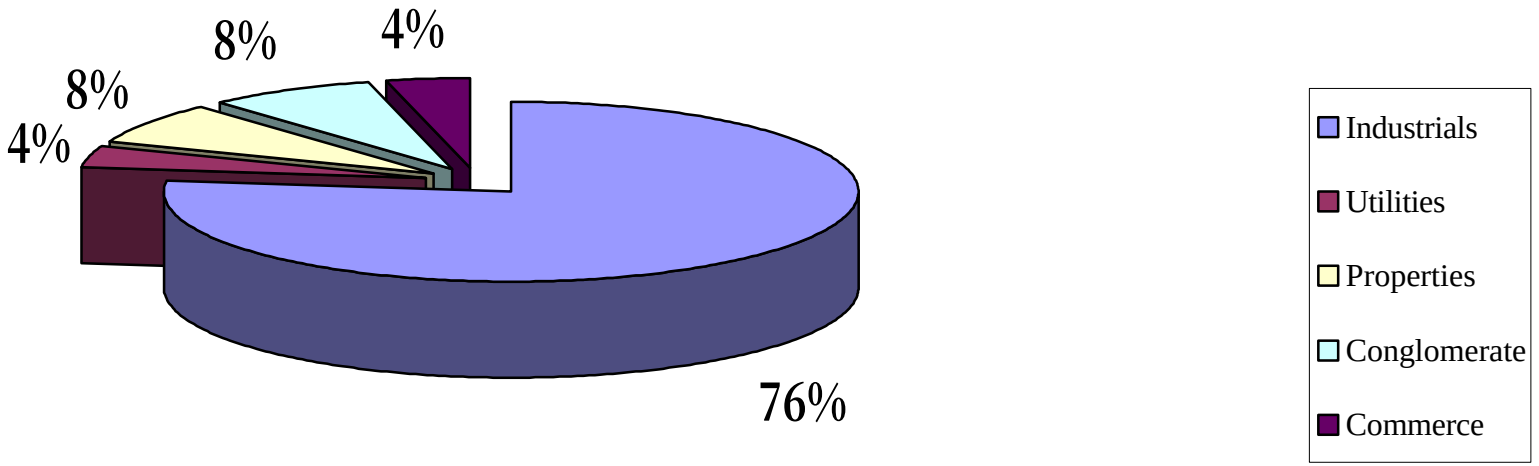
No	Code	Company Name	Listing Date (mm/dd/yy)	Type	Market Capitalization (in millions Renminbi)	% Total Market Capitalization
1	600604	Shanghai Erfangji Co. Ltd.	03-27-92	Industrial	¥ 1,261.32	0.23%
2	600610	China Textile Machinery Co. Ltd.	08-05-92	Industrial	¥ 928.49	0.17%
3	600611	Shanghai Dazhong Taxi Co. Ltd.	08-07-92	Utilities	¥ 1,817.86	0.33%
4	600612	China First Pencil Co. Ltd.	08-14-92	Industrial	¥ 773.51	0.14%
5	600613	Shanghai Wingsung Stationery Co. Ltd.	28-02-92	Industrial	¥ 654.27	0.12%
6	600614	Shanghai Rubber Belt Co. Ltd.	08-28-92	Industrial	¥ 404.36	0.07%
7	600617	Shanghai Lianhua Fiber Co. Ltd.	10-13-92	Industrial	¥ 764.86	0.14%
8	600618	Shanghai Chlor-Alkali Chemical Co. Ltd.	11-13-92	Industrial	¥ 5,756.45	1.05%
9	600619	Shanghai Refrigerator Compressor Co. Ltd.	11-16-92	Industrial	¥ 2,429.95	0.44%
10	600623	Shanghai Tyre & Rubber Co. Ltd.	12-04-92	Industrial	¥ 5,664.53	1.03%
11	600648	Shanghai Wai Gaoqiao Free Trade Zone Development Co. Ltd.	03-05-93	Properties	¥ 7,470.00	1.36%
12	600663	Shanghai Luijiazui Finance & Trade Zone Development Co. Ltd.	06-28-93	Properties	¥ 24,959.64	4.55%
13	600679	Shanghai Phoenix Bicycle Co. Ltd.	10-08-93	Industrial	¥ 1,467.75	0.27%
14	600680	Shanghai Posts & Telecommunication Equipment Co. Ltd.	10-18-93	Industrial	¥ 913.61	0.17%
15	600695	Shanghai Dajiang (Group) Co. Ltd.	11-22-93	Conglomerate	¥ 3,828.19	0.70%
16	600801	Huaxin Cement Co. Ltd.	01-03-94	Industrial	¥ 968.31	0.18%
17	600818	Shanghai Forever Bicycle Co. Ltd.	01-28-94	Industrial	¥ 906.34	0.17%
18	600819	Shanghai Yaohua Pilkington Glass Co. Ltd.	01-28-94	Industrial	¥ 2,954.37	0.54%
19	600822	Shanghai Goods & Materials Trade Centre Co. Ltd.	02-04-94	Conglomerate	¥ 950.13	0.17%
20	600827	Shanghai Friendship Overseas Chinese Co. Ltd.	02-04-94	Commerce	¥ 632.61	0.12%
21	600835	Shanghai shangling Electric Appliances Co. Ltd.	02-24-94	Industrial	¥ 2,004.12	0.37%
22	600841	Shanghai Diesel Engine Group Co. Ltd.	03-11-94	Industrial	¥ 3,107.64	0.57%
23	600843	Shanghai Industrial Sewing Manchine Co. Ltd.	03-11-94	Industrial	¥ 679.46	0.12%
24	600845	Shanghai Steel Tube Co. Ltd.	03-11-94	Industrial	¥ 958.34	0.17%
25	600848	Shanghai Automation Instrumentation Co. Ltd.	03-24-94	Industrial	¥ 1,438.97	0.26%
26	600851	Shanghai Haixin Co. Ltd.	04-04-94	Industrial	¥ 1,164.33	0.21%
				Total	¥ 74,859.41	13.65%

No	Code	Company Name	Listing Date (mm/dd/yy)	Type	Market Capitalization (in millions Renminbi)	% Total of Market Capitalization
1	900902	Shanghai Erfangji Co. Ltd.	07-01-92	Industrial	¥ 302.21	0.06%
2	900906	China Textile Machinery Co. Ltd.	07-02-92	Industrial	¥ 154.03	0.03%
3	900903	Shanghai Dazhong Taxi Co. Ltd.	07-22-92	Utilities	¥ 694.98	0.13%
4	900905	China First Pencil Co. Ltd.	07-28-92	Industrial	¥ 266.26	0.05%
5	900904	Shanghai Wingsung Stationery Co. Ltd.	07-22-92	Industrial	¥ 80.15	0.01%
6	900907	Shanghai Rubber Belt Co. Ltd.	07-28-92	Industrial	¥ 65.71	0.01%
7	900913	Shanghai Lianhua Fiber Co. Ltd.	09-28-93	Industrial	¥ 61.53	0.01%
8	900908	Shanghai Chlor-Alkali Chemical Co. Ltd.	08-20-92	Industrial	¥ 775.07	0.14%
9	900910	Shanghai Refrigerator Compressor Co. Ltd.	01-18-93	Industrial	¥ 622.92	0.11%
10	900909	Shanghai Tyre & Rubber Co. Ltd.	08-28-92	Industrial	¥ 777.52	0.14%
11	900912	Shanghai Wai Gaoqiao Free Trade Zone Development Co. Ltd.	07-06-93	Properties	¥ 668.41	0.12%
12	900932	Shanghai Luijiazui Finance & Trade Zone Development Co. Ltd.	11-22-94	Properties	¥ 2,941.83	0.54%
13	900916	Shanghai Phoenix Bicycle Co. Ltd.	11-19-93	Industrial	¥ 164.29	0.03%
14	900930	Shanghai Posts & Telecommunication Equipment Co. Ltd.	10-20-94	Industrial	¥ 210.09	0.04%
15	900919	Shanghai Dajiang (Group) Co. Ltd.	12-15-93	Conglomerate	¥ 192.54	0.04%
16	900933	Huaxin Cement Co. Ltd.	12-09-94	Industrial	¥ 202.13	0.04%
17	900915	Shanghai Forever Bicycle Co. Ltd.	11-15-93	Industrial	¥ 84.63	0.02%
18	900918	Shanghai Yaohua Pilkington Glass Co. Ltd.	12-10-93	Industrial	¥ 493.71	0.09%
19	900927	Shanghai Goods & Materials Trade Centre Co. Ltd.	03-30-94	Conglomerate	¥ 92.18	0.02%
20	900923	Shanghai Friendship Overseas Chinese Co. Ltd.	01-05-94	Commerce	¥ 191.01	0.03%
21	900925	Shanghai shangling Electric Appliances Co. Ltd.	01-13-94	Industrial	¥ 341.39	0.06%
22	900920	Shanghai Diesel Engine Group Co. Ltd.	12-28-93	Industrial	¥ 853.48	0.16%
23	900924	Shanghai Industrial Sewing Manchine Co. Ltd.	01-18-94	Industrial	¥ 118.24	0.02%
24	900926	Shanghai Steel Tube Co. Ltd.	03-11-94	Industrial	¥ 138.73	0.03%
25	900928	Shanghai Automation Instrumentation Co. Ltd.	04-29-94	Industrial	¥ 158.70	0.03%
26	900917	Shanghai Haixin Co. Ltd.	08-12-94	Industrial	¥ 160.24	0.03%
				Total	¥ 10,811.98	1.97%

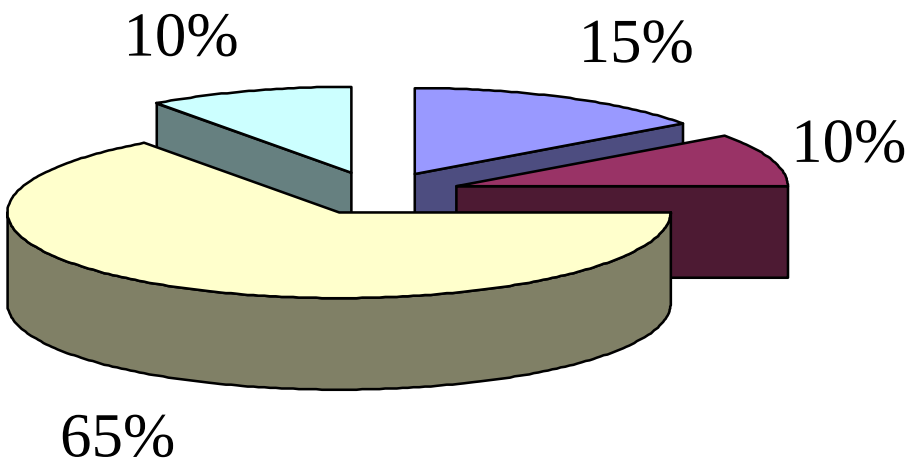
No	Code	Company Name	Listing Date (mm/dd/yy)	Type	Market Capitalization (in millions Renminbi)	% Total Market Capitalization
1	2002	China Vanke Co. Ltd	05-28-93	Conglomerate	¥ 433.66	0.10%
2	2003	Shenzhen Gintian Industry Co. Ltd	06-29-93	Conglomerate	¥ 326.99	0.07%
3	2011	Shenzhen Properties & Resources Development (Group) Co. Ltd.	03-30-92	Properties	¥ 282.42	0.06%
4	2012	China Southern Glass Co. Ltd.	02-28-92	Industrial	¥ 915.46	0.21%
5	2013	Shenzhen Petrochemical (Holdings) Co. Ltd.	05-06-92	Conglomerate	¥ 154.94	0.04%
6	2015	Shenzhen Zhonghao (Group) Co. Ltd.	06-25-92	Industrial	¥ 104.76	0.02%
7	2016	Konka (Group) Co. Ltd.	03-27-92	Industrial	¥ 1,506.99	0.35%
8	2018	Victor Onward Textile Industrial Co. Ltd.	06-16-92	Industrial	¥ 233.42	0.05%
9	2019	Shenzhen Shenbao Industrial Co. Ltd.	10-12-92	Industrial	¥ 111.31	0.03%
10	2020	Shenzhen Huafa Electronics Co. Ltd.	04-28-92	Industrial	¥ 656.18	0.15%
11	2024	Shekou Zhao Shang Habour Service Holdings Co. Ltd.	06-07-93	Utilities	¥ 760.96	0.17%
12	2025	Shenzhen Tellus Manchinery & Electronics Co. Ltd.	06-21-93	Industrial	¥ 86.99	0.02%
13	2026	Shenzhen Fiyta Holdings Ltd.	06-03-93	Industrial	¥ 193.19	0.04%
14	2028	Shenzhen Health Mineral Eater Co. Ltd.	08-09-93	Industrial	¥ 152.42	0.03%
15	2029	Shenzhen SEZ Real Estate & Properties (Group) Co. Ltd.	01-10-94	Properties	¥ 607.92	0.14%
16	2030	Shenzhen Lionda Holdings Co. Ltd.	09-29-93	Industrial	¥ 166.43	0.04%
17	2037	Shenzhen Nanshan Power Station Co. Ltd.	11-28-94	Utilities	¥ 203.90	0.05%
18	2039	China International Marine Containers Co. Ltd.	03-23-94	Industrial	¥ 1,220.12	0.28%
19	2045	Shenzhen Textile (Holdings) Co. Ltd.	08-15-94	Industrial	¥ 98.32	0.02%
20	2513	Zhuhai Special Economic Zone Lizhu Pharmaceutical Group Inc.	07-20-93	Industrial	¥ 407.43	0.09%
				Total	¥ 8,623.81	1.98%

No	Code	Company Name	Listing Date (mm/dd/yy)	Type	Market Capitalization (in millions Renminbi)	% Total Market Capitalization
1	0002	China Vanke Co. Ltd	01-29-91	Conglomerate	¥ 2,578.89	0.59%
2	0003	Shenzhen Gintian Industry Co. Ltd	07-03-91	Conglomerate	¥ 2,247.23	0.51%
3	0011	Shenzhen Properties & Resources Development (Group) Co. Ltd.	03-30-92	Properties	¥ 3,847.52	0.88%
4	0012	China Southern Glass Co. Ltd.	02-28-92	Industrial	¥ 2,896.10	0.66%
5	0013	Shenzhen Petrochemical (Holdings) Co. Ltd.	05-06-92	Conglomerate	¥ 2,221.58	0.51%
6	0015	Shenzhen Zhonghao (Group) Co. Ltd.	06-25-92	Industrial	¥ 1,483.69	0.34%
7	0016	Konka (Group) Co. Ltd.	03-27-92	Industrial	¥ 3,252.78	0.75%
8	0018	Victor Onward Textile Industrial Co. Ltd.	06-16-92	Industrial	¥ 621.25	0.14%
9	0019	Shenzhen Shenbao Industrial Co. Ltd.	10-12-92	Industrial	¥ 1,860.35	0.43%
10	0020	Shenzhen Huafa Electronics Co. Ltd.	01-28-92	Industrial	¥ 1,443.78	0.33%
11	0024	Shekou Zhao Shang Habour Service Holdings Co. Ltd.	06-07-93	Utilities	¥ 2,228.00	0.51%
12	0025	Shenzhen Tellus Manchinery & Electronics Co. Ltd.	06-21-93	Industrial	¥ 944.20	0.22%
13	0026	Shenzhen Fiyta Holdings Ltd.	06-03-93	Industrial	¥ 1,374.12	0.31%
14	0028	Shenzhen Health Mineral Eater Co. Ltd.	08-09-93	Industrial	¥ 1,470.85	0.34%
15	0029	Shenzhen SEZ Real Estate & Properties (Group) Co. Ltd.	09-15-93	Properties	¥ 8,310.27	1.90%
16	0030	Shenzhen Lionda Holdings Co. Ltd.	09-29-93	Industrial	¥ 1,925.86	0.44%
17	0037	Shenzhen Nanshan Power Station Co. Ltd.	17-01-94	Utilities	¥ 1,580.86	0.36%
18	0039	China International Marine Containers Co. Ltd.	04-08-94	Industrial	¥ 1,416.38	0.32%
19	0045	Shenzhen Textile (Holdings) Co. Ltd.	08-15-94	Industrial	¥ 758.58	0.17%
20	0513	Zhuhai Special Economic Zone Lizhu Pharmaceutical Group Inc.	10-28-93	Industrial	¥ 1,086.82	0.25%
				Total	¥ 43,549.11	9.98%

Shanghai Stocks by Industry Type



Shenzhen Stocks by Industry Type



1	gr.mar	gross margin=	gross profit / Sales
2	oper.mar	operating margin=	operating income / Sales
3	m.b.tax	margin before tax=	EBIT / Sales
4	p.tax mar	pretax margin=	pretax income / Sales
5	n.p.mar	net profit margin=	pretax income-income tax expense x 100% / Sales
6	roa	return on total assets=	operating income / average total assets
7	roe	return on common equity=	net income / average total equity
8	p.ir.ast	pre-interst return on assets=	ebit / total assets
9	curt rat	current ratio=	current assets / current liabilities
10	quk rat	quick ratio=	cash and cash equivalents / currents liabilities
11	wc	working capital=	current asset- current liabilities
12	op exp	operating expense ratio=	operating expense / net sales
13	op in	operating income=	gross profit- operating expense
14	int cov 2	interes coverage=	operating income (as calculated in (13)) / interest expense
	int cov	interes coverage=	operating income (as provided in TEJ database) / interest expense
15	stk turo	stock turnover=	cost of good sold / average stock
16	fx.ast.u	fixed asset utilisation=	sales / net fixed assets

17	to.ast.u	total asset utilisation=	sales / average total assets
18	ni.nv	et income as a % of net sales	net income / net sales
19	liab ast	liabilities to assets=	total liabilities / total assets
20	eps	earning per share=	provided by TEJ database
21	pe	price earning ratio=	current stock price / eps
22	g.in.mar	gross interest margin=	interest income - interest expense / interest income
23	inv turo	inventory turnover=	cost of good sold / average inventory
24	pay turo	payable turnover=	sales / average account payable
25	pay out	average number of days payable outstanding=	365 / payable turnover
26	fx.ast.t	fixed assets turnover=	sales / average total assets
27	cas rat	cash ratio=	cash + marketable securities / current liabilities
28	time.in.e	times interest earned=	earning before interest and taxes / interest expense
29	pro mar	profit margin=	net income / sales
30	div.pay	dividend payout =	Dividend / net income

Regression

Notes		
Output Created		1999/3/30 16:36
Comments		
Input	**Data**	C:\My Documents\SPSS output\A shares.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	46
Missing Value Handling	**Definition of Missing**	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any
Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS BCOV R ANOVA COLLIN /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT reta /METHOD=ENTER fac1_1 fac2_1 fac3_1 fac4_1 fac5_1 /RESIDUALS DURBIN HIST(ZRESID)
Resources	**Memory Required**	2972 bytes
	Additional Memory Required for Residual Plots	624 bytes
	Elapsed Time	00:04.0

Descriptive Statistics			
	Mean	**Std. Deviation**	**N**
RETA	2.64E-03	2.73E-03	46
REGR factor score 1 for analysis 1	1.63E-17	1	46
REGR factor score 2 for analysis 1	1.13E-16	1	46
REGR factor score 3 for analysis 1	-4.53E-17	1	46
REGR factor score 4 for analysis 1	2.12E-16	1	46
REGR factor score 5 for analysis 1	1.45E-17	1	46

Correlations							
		RETA	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
Pearson Correlation	RETA	1	0.337	0.06	-0.011	-0.291	0.292
	REGR factor score 1 for analysis 1	0.337	1	0	0	0	0
	REGR factor score 2 for analysis 1	0.06	0	1	0	0	0
	REGR factor score 3 for analysis 1	-0.011	0	0	1	0	0
	REGR factor score 4 for analysis 1	-0.291	0	0	0	1	0
	REGR factor score 5 for analysis 1	0.292	0	0	0	0	1

Correlations							
		RETA	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
Sig. (1-tailed)	RETA	.	0.011	0.346	0.472	0.025	0.025
	REGR factor score 1 for analysis 1	0.011	.	0.5	0.5	0.5	0.5
	REGR factor score 2 for analysis 1	0.346	0.5	.	0.5	0.5	0.5
	REGR factor score 3 for analysis 1	0.472	0.5	0.5	.	0.5	0.5
	REGR factor score 4 for analysis 1	0.025	0.5	0.5	0.5	.	0.5
	REGR factor score 5 for analysis 1	0.025	0.5	0.5	0.5	0.5	.

Correlations							
		RETA	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
N	RETA	46	46	46	46	46	46
	REGR factor score 1 for analysis 1	46	46	46	46	46	46
	REGR factor score 2 for analysis 1	46	46	46	46	46	46
	REGR factor score 3 for analysis 1	46	46	46	46	46	46
	REGR factor score 4 for analysis 1	46	46	46	46	46	46
	REGR factor score 5 for analysis 1	46	46	46	46	46	46

Variables Entered/Removed(b)			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1(a)	.	Enter
a All requested variables entered.			
b Dependent Variable: RETA			

Model Summary(b)					
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Durbin-Watson**
1	.536(a)	0.287	0.198	2.45E-03	1.013
a Predictors: (Constant), REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1					
b Dependent Variable: RETA					

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.66E-05	5	1.93E-05	3.221	.015(a)
	Residual	2.40E-04	40	6.00E-06		
	Total	3.37E-04	45			
a Predictors: (Constant), REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1						
b Dependent Variable: RETA						

Coefficients(a)								
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.64E-03	0		7.322	0		
	REGR factor score 1 for analysis 1	9.22E-04	0	0.337	2.526	0.016	1	1
	REGR factor score 2 for analysis 1	1.65E-04	0	0.06	0.451	0.655	1	1
	REGR factor score 3 for analysis 1	-2.91E-05	0	-0.011	-0.08	0.937	1	1
	REGR factor score 4 for analysis 1	-7.95E-04	0	-0.291	-2.178	0.035	1	1
	REGR factor score 5 for analysis 1	7.98E-04	0	0.292	2.185	0.035	1	1
a Dependent Variable: RETA								

Coefficient Correlations(a)							
Model			REGR factor score 5 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 1 for analysis 1
1	Correlations	REGR factor score 5 for analysis 1	1	0	0	0	0
		REGR factor score 4 for analysis 1	0	1	0	0	0
		REGR factor score 3 for analysis 1	0	0	1	0	0
		REGR factor score 2 for analysis 1	0	0	0	1	0
		REGR factor score 1 for analysis 1	0	0	0	0	1
	Covariances	REGR factor score 5 for analysis 1	1.33E-07	0	0	0	0
		REGR factor score 4 for analysis 1	0	1.33E-07	0	0	0
		REGR factor score 3 for analysis 1	0	0	1.33E-07	0	0
		REGR factor score 2 for analysis 1	0	0	0	1.33E-07	0
		REGR factor score 1 for analysis 1	0	0	0	0	1.33E-07

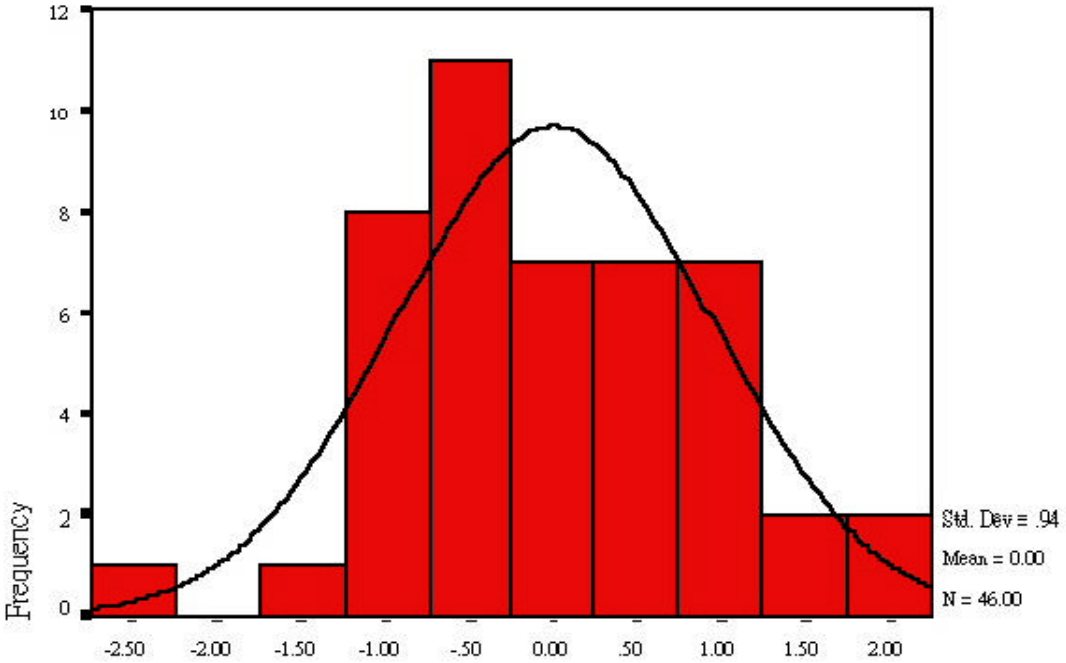
a Dependent Variable: RETA

Collinearity Diagnostics(a)									
		Eigenvalue	Condition Index	Variance Proportions					
Model	Dimension			(Constant)	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
1	1	1	1	0	0.53	0.4	0.01	0.07	0
	2	1	1	0.5	0	0.11	0.02	0.37	0
	3	1	1	0	0.47	0.39	0	0.14	0
	4	1	1	0	0	0	0	0	1
	5	1	1	0.5	0	0.11	0.02	0.37	0
	6	1	1	0	0	0	0.96	0.04	0
a Dependent Variable: RETA									

Residuals Statistics(a)					
	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	4.79E-05	7.70E-03	2.64E-03	1.47E-03	46
Residual	-6.21E-03	5.05E-03	3.49E-19	2.31E-03	46
Std. Predicted Value	-1.772	3.45	0	1	46
Std. Residual	-2.537	2.062	0	0.943	46
a Dependent Variable: RETA					

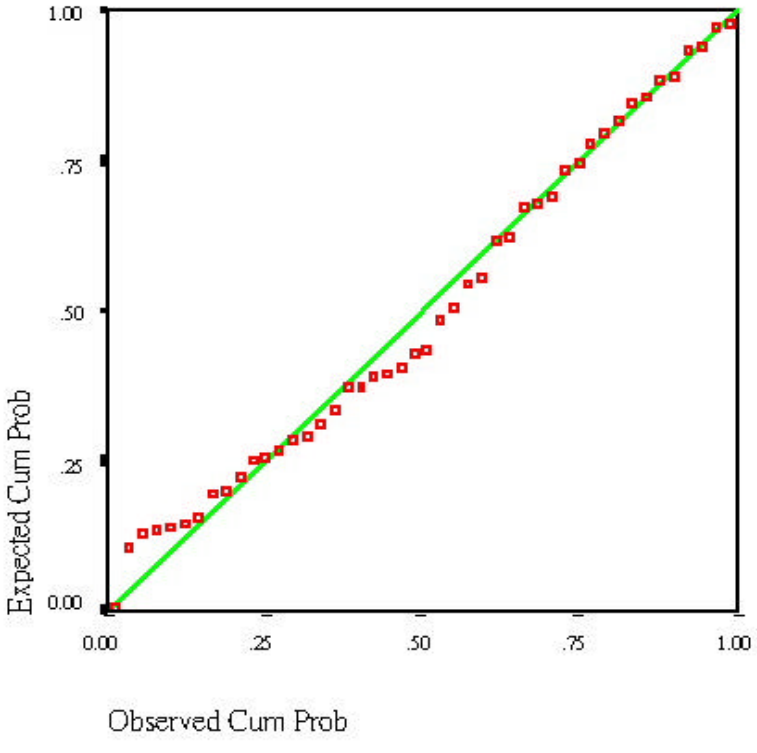
Histogram

Dependent Variable: RETA



Normal P-P Plot of Regression Standardized Residual

Dependent Variable: RETA



Regression

Notes		
Output Created		1999/4/5 15:42
Comments		
Input	**Data**	C:\My Documents\SPSS output\B shares.sav
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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	46
Missing Value Handling	**Definition of Missing**	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any
Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS CI BCOV R ANOVA COLLIN /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT retb /METHOD=ENTER fac1_1 fac2_1 fac3_1 fac4_1 fac5_1 /RESIDUALS DURBIN HIST(ZRESID)
Resources	**Memory Required**	2972 bytes
	Additional Memory Required for Residual Plots	624 bytes
	Elapsed Time	00:05.6

Descriptive Statistics			
	Mean	**Std. Deviation**	**N**
RETB	-3.99E-02	0.292944869	46
REGR factor score 1 for analysis 1	-6.15E-17	1	46
REGR factor score 2 for analysis 1	5.13E-18	1	46
REGR factor score 3 for analysis 1	4.45E-17	1	46
REGR factor score 4 for analysis 1	-6.94E-17	1	46
REGR factor score 5 for analysis 1	-3.86E-17	1	46

Correlations							
		RETB	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
Pearson Correlation	RETB	1	-0.487	-0.065	-0.005	-0.003	0.159
	REGR factor score 1 for analysis 1	-0.487	1	0	0	0	0
	REGR factor score 2 for analysis 1	-0.065	0	1	0	0	0
	REGR factor score 3 for analysis 1	-0.005	0	0	1	0	0
	REGR factor score 4 for analysis 1	-0.003	0	0	0	1	0
	REGR factor score 5 for analysis 1	0.159	0	0	0	0	1

Correlations							
		RETB	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
Sig. (1-tailed)	RETB	.	0	0.334	0.488	0.492	0.145
	REGR factor score 1 for analysis 1	0	.	0.5	0.5	0.5	0.5
	REGR factor score 2 for analysis 1	0.334	0.5	.	0.5	0.5	0.5
	REGR factor score 3 for analysis 1	0.488	0.5	0.5	.	0.5	0.5
	REGR factor score 4 for analysis 1	0.492	0.5	0.5	0.5	.	0.5
	REGR factor score 5 for analysis 1	0.145	0.5	0.5	0.5	0.5	.

Correlations							
		RETB	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
N	RETB	46	46	46	46	46	46
	REGR factor score 1 for analysis 1	46	46	46	46	46	46
	REGR factor score 2 for analysis 1	46	46	46	46	46	46
	REGR factor score 3 for analysis 1	46	46	46	46	46	46
	REGR factor score 4 for analysis 1	46	46	46	46	46	46
	REGR factor score 5 for analysis 1	46	46	46	46	46	46

Variables Entered/Removed(b)			
Model	**Variables Entered**	Variables Removed	Method
1	REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1(a)		Enter
a All requested variables entered.			
b Dependent Variable: RETB			

Model Summary(b)											
	R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**					**Durbin-Watson**
Model					**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**	
1	.517(a)	0.267	0.175	0.266035652	0.267	2.913	5	40	0.025	1.893
a Predictors: (Constant), REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1										
b Dependent Variable: RETB										

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.031	5	0.206	2.913	.025(a)
	Residual	2.831	40	7.08E-02		
	Total	3.862	45			
a Predictors: (Constant), REGR factor score 5 for analysis 1 , REGR factor score 4 for analysis 1 , REGR factor score 3 for analysis 1 , REGR factor score 2 for analysis 1 , REGR factor score 1 for analysis 1						
b Dependent Variable: RETB						

Coefficients(a)													
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-3.99E-02	0.039		-1.018	0.315	-0.119	0.039					
	REGR factor score 1 for analysis 1	-0.143	0.04	-0.487	-3.599	0.001	-0.223	-0.063	-0.487	-0.495	-0.487	1	1
	REGR factor score 2 for analysis 1	-1.90E-02	0.04	-0.065	-0.48	0.634	-0.099	0.061	-0.065	-0.076	-0.065	1	1
	REGR factor score 3 for analysis 1	-1.35E-03	0.04	-0.005	-0.034	0.973	-0.082	0.079	-0.005	-0.005	-0.005	1	1
	REGR factor score 4 for analysis 1	-8.39E-04	0.04	-0.003	-0.021	0.983	-0.081	0.079	-0.003	-0.003	-0.003	1	1
	REGR factor	4.66E-02	0.04	0.159	1.175	0.247	-0.034	0.127	0.159	0.183	0.159	1	1
a Dependent Variable: RETB													

Coefficient Correlations(a)							
Model			REGR factor score 5 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 1 for analysis 1
1	Correlations	REGR factor score 5 for analysis 1	1	0	0	0	0
		REGR factor score 4 for analysis 1	0	1	0	0	0
		REGR factor score 3 for analysis 1	0	0	1	0	0
		REGR factor score 2 for analysis 1	0	0	0	1	0
		REGR factor score 1 for analysis 1	0	0	0	0	1
	Covariances	REGR factor score 5 for analysis 1	1.57E-03	0	0	0	0
		REGR factor score 4 for analysis 1	0	1.57E-03	0	0	0
		REGR factor score 3 for analysis 1	0	0	1.57E-03	0	0
		REGR factor score 2 for analysis 1	0	0	0	1.57E-03	0
		REGR factor score 1 for analysis 1	0	0	0	0	1.57E-03

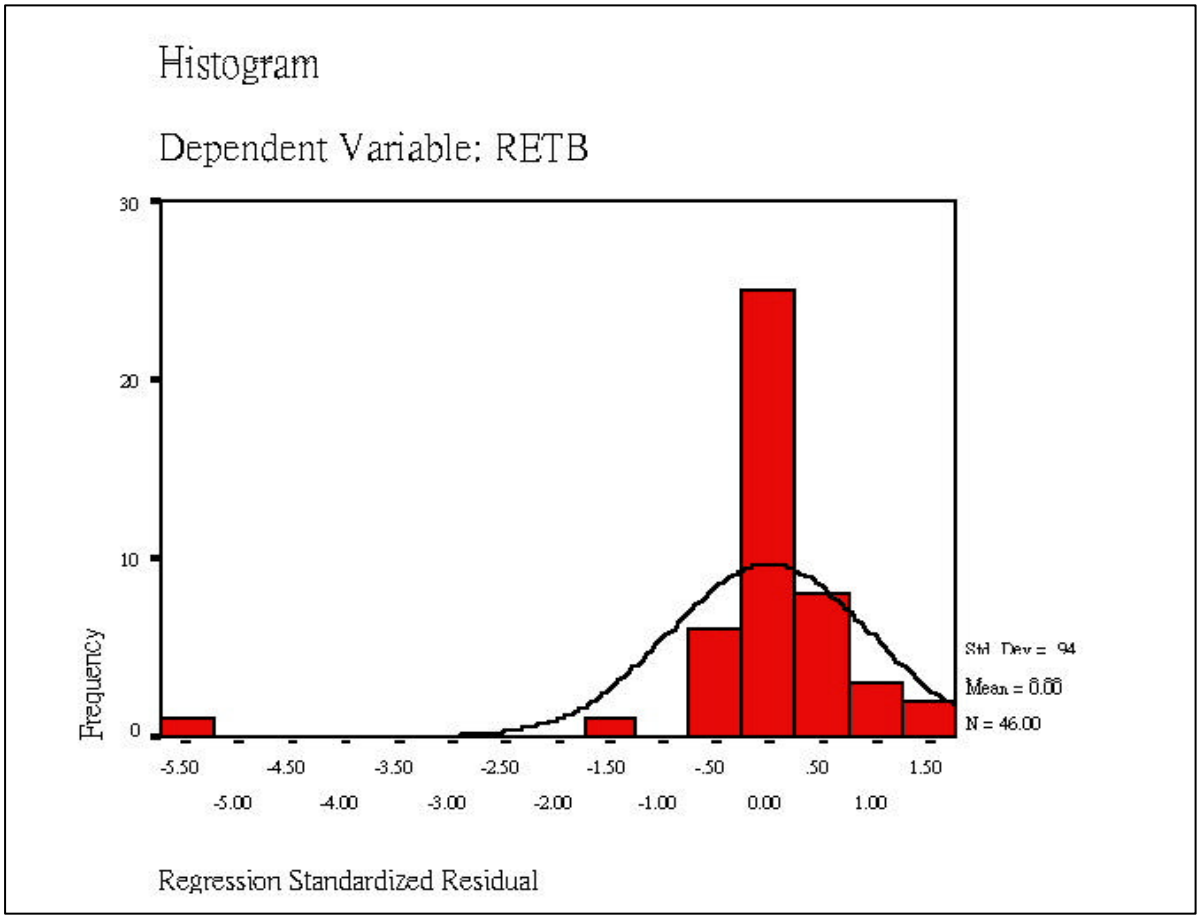
a Dependent Variable: RETB

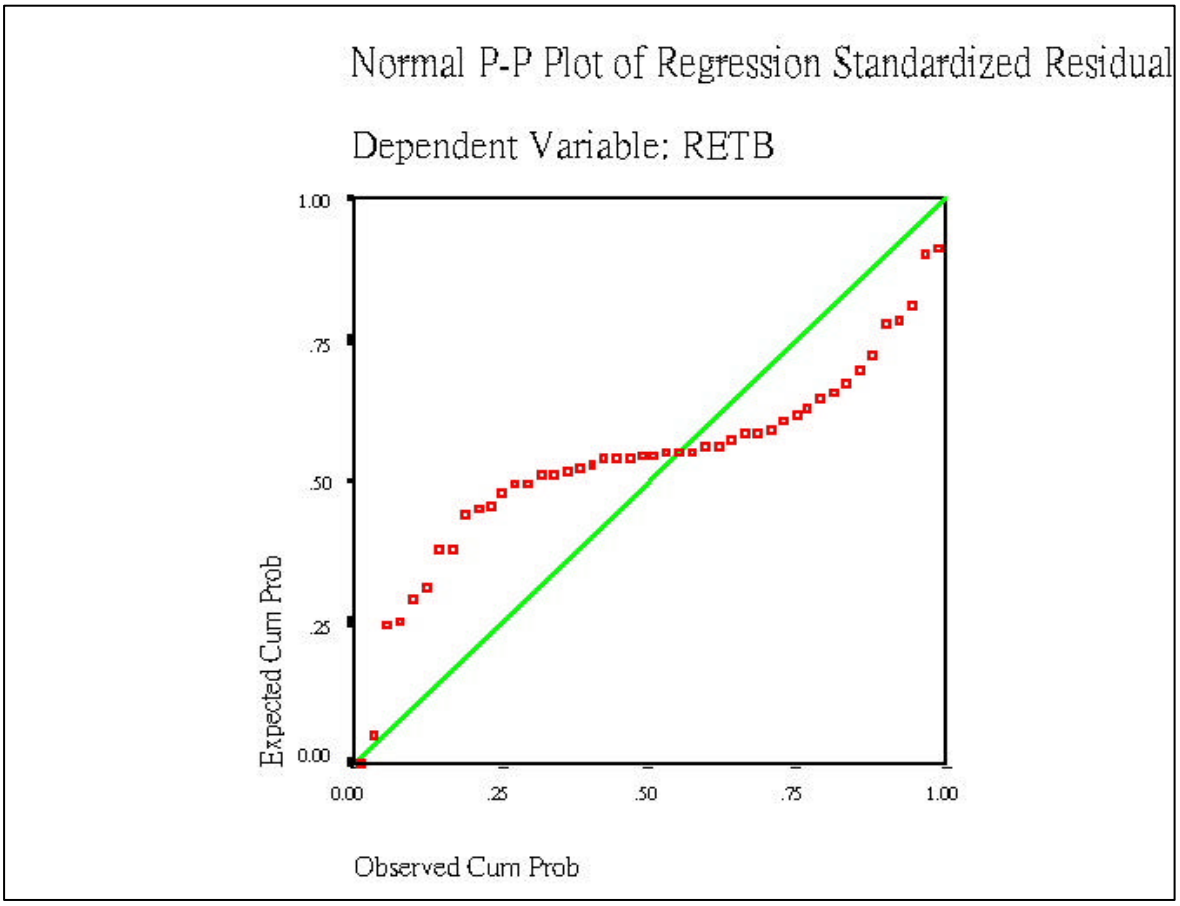
Collinearity Diagnostics(a)									
		Eigenvalue	Condition Index	Variance Proportions					
Model	Dimension			(Constant)	REGR factor score 1 for analysis 1	REGR factor score 2 for analysis 1	REGR factor score 3 for analysis 1	REGR factor score 4 for analysis 1	REGR factor score 5 for analysis 1
1	1	1	1	0	0.42	0.28	0	0.3	0
	2	1	1	0	0.35	0	0.22	0.42	0
	3	1	1	1	0	0	0	0	0
	4	1	1	0	0	0	0	0	1
	5	1	1	0	0.14	0.71	0	0.15	0
	6	1	1	0	0.09	0	0.78	0.13	0
a Dependent Variable: RETB									

Casewise Diagnostics(a)		
Case Number	Std. Residual	RETB
32	-5.343	-1.983324771
a Dependent Variable: RETB		

Residuals Statistics(a)					
	Minimum	**Maximum**	**Mean**	**Std. Deviation**	**N**
Predicted Value	-0.56177944	0.443504483	-3.99E-02	0.151346007	46
Residual	-1.42154527	0.355626702	1.03E-17	0.250820818	46
Std. Predicted Value	-3.448	3.194	0	1	46
Std. Residual	-5.343	1.337	0	0.943	46
a Dependent Variable: RETB					

Charts


Histogram
Dependent Variable: RETB
Frequency
30
20
10
0
Std. Dev = .94
Mean = 0.00
N = 46.00
-5.50
-4.50
-3.50
-2.50
-1.50
-.50
.50
1.50
-5.00
-4.00
-3.00
-2.00
-1.00
0.00
1.00
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: RETB
Expected Cum Prob
1.00
.75
.50
.25
0.00
0.00
.25
.50
.75
1.00
Observed Cum Prob