

DO FUNDAMENTAL FACTORS EXPLAIN
STOCK RETURNS

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FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF FINANCE

AUGUST 2012

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A research project submitted in partial fulfillment of the
requirement for the degree of

BACHELOR OF BUSINESS ADMINISTRATION
(HONS) BANKING AND FINANCE

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF FINANCE

AUGUST 2012

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- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the research project.
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Date: 30 August 2012

ACKNOWLEDGEMENT

At the beginning, we, the researchers would like to take this opportunity to express our gratitude to all the parties helping us at the project time.

First and foremost, we would like to thank our beloved UNIVERSITI TUNKU ABDUL RAHMAN for giving us the opportunity to conduct and learn from this project. By conducting this project, we developed the valuable knowledge and skills that are useful for our future life. Not at least for that, we able to build up cohesiveness among team members and become more collaborative in doing complicated task in future.

By the way, we would also like to show gratitude to our supervisor, Mr. LIM TZE JIAN, who has been motivated us through his patient and knowledge, unrivalled support, expert guidance and also constant encouragement throughout all stages of the thesis whilst allowing us completing the project by effectively and on time.

Besides, we also want to express our grateful gratitude to our coordinator, Ms. Josephine Kuah Yoke Chin, who is hold, the post of research project coordinator which providing us the guideline for doing the research report.

Besides, we are highly appreciated to each of our group members for cooperation to complete whole research project. We had learned the way to solve problems together, provide the unwavering support and encouragement for each other and respect each other.

We also like to express the sincere thanks, deepest appreciation and also affection to our family members for always being there, for having complete faith in us, for helping us a lot in gathering different information and believing from the very beginning that this journey would be completed.

DEDICATION

We would like to dedicate this thesis to our parents who provide us with all kind of support such as financial, moral support, and encouragement. With their support, we are able to complete to pursue our bachelor degree with the accomplishment of this thesis. They educate us to be perseverant and persistent. When facing any difficulties and obstacles, we should not relinquish easily but in contrast, we should challenge it with courage.

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LIST OF ABBREVIATIONS

| | |
|-----------|-------------------------------------------------|
| S&P 500 | Standard and Poor 500 |
| EFA | Exploratory Factor Analysis |
| OLS | Ordinary Least Square |
| P/E Ratio | Price to earning ratio |
| CAPM | Capital Asset Pricing Model |
| CF | Cash Flow |
| CRSP | Chicago's centre for Research in Security Price |
| DJIA | Dow Jones Industrial Average |

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PREFACE

The behavior of stock return had capture concerns of every investor around the world. Stock return can be defined as profit from investment on a share of stock. It serves as a kind of compensation for investor who willing to assume the risk like default risk. Investor's stock return can be obtained by calculating the differential between selling and buying price of stock. Moreover, stock return can be influenced by many internal or external factors. Any favorable and unfavorable movement of stock price will brought the effect of profit or loss for investors. Thus, there is crucial to investigate whether fundamental factors play a key role in explaining cross-sectional variation of stock return.

This study is to examine whether fundamental factors explaining the stock return by using S&P 500's data. This research is important as there are no previous studies can fully conclude whether fundamental factors has strong explanatory power on stock return and which fundamental factor play a predominant factor in explaining stock return.

The research enables reader to better understanding the stock market and makes wise stock investment decision by providing guidelines on which fundamental factor should be focus on during the stock selection. As for regulator, they can set a better rules and regulation for public listed companies in the stock exchange.

ABSTRACT

This study empirically examines the ability of fundamental factors (firm size, market-to-book equity, earnings, cash flow and etc.) in explaining cross-sectional variation of stock return in the United States stock exchange.

Arbitrage Pricing Theory (APT) is used in this study for design the conceptual framework. We applied Exploratory Factor Analysis (EFA) during the stage of data processing with the purpose of reduce redundancy of large set of variables. S&P 500 data had been used as our secondary data of research. The hypotheses then were tested using the multiple regression models (OLS technique). Consistent with previous studies, our results suggest that there all the individual variables has significant effect on stock returns. However, we are unable to conclude whether there is an existence of significant relationship between individual variables and stock return due to certain data issues which solving method is beyond our scope of this study.

Keywords Arbitrage Pricing Theory (APT), Exploratory Factor Analysis (EFA),
Fundamental Factors, Stock return,

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

This chapter will discuss the background of Dow Jones Economic Sentiment Indicator (ESI), S&P 500 Index, and New York Stock Exchange Market. In addition, the research problems and objectives will also be discussed. This will be followed by the research questions, hypothesis, and lastly the significance of the study.

1.1 Background of the Study

Charles Dow, Edward Jones, and Charles Bergstresser, who were the reporters founded of Dow Jones & Company in year 1882. The company provide information and journal regarding technology, and publish financial information of firms to highlight the important topics to help investors in decision making. The business of Dow Jones is mainly in collecting and spreading useful information to business, investment, and consumer markets. In year 1885, Dow expressed the Dow Theory of stock market movements and started to launch the Wall Street Journal with Jones. It has become the best known publisher of Wall Street Journal in U.S., Asian, and European. The company is also illustrious for the worldwide stock market intelligence it provides. 64% of the voting stock was led by the Bancroft family for 105 years, and was taken control by News Corporation in year 2007. Thereby Newscorp owned Dow Jones & Company as a subsidiary (Dow Jones History, 2012).

The Dow Jones Economic Sentiment Indicator (ESI) is a reliable leading indicator which collects historical references from the 15 major daily newspapers monthly, and is presented in numerical scale, calculated using a media tracking and analysis tool, namely the Dow Jones Insight (Dow Jones economic sentiment indicator overview,

n.d.).

Henry Varnum Poor, a lawyer and journalist, who was the founder of S&P 500 Stock Market Index. He was the first to compile the growth of the railroad business, and its financial operations. He formed the H.V. and H.W. Poor, Co. in 1868 together with his son, Henry W. Poor. The company provides all related financial information of the US railroad industry. In year 1873, firm has become one of the leading banking and insurance institutions on Wall Street for more than 30 years (History of the S&P 500 Index, 2012).

Standard Statistics Bureau was founded in year 1906 by Luther Lee Blake to provide information on non-railroad companies. Before it incorporated into “Standard Statistics Inc”, Blake bought “Babson Stock and Bond System” from Edward Shattuck and Roy W. Porter. Meanwhile Roy successfully purchased the Poor’s company, and applied the based-weighted aggregate techniques for calculating the index in Standard & Poor, which was much more complicate than Dow Jones Industrial Average. The integration of 50 industrials, 20 railroad stocks, and 20 utility stocks made up the Stock Composition Price Index, which computed on a daily basis. Standard & Poor has become one of the largest corporate bond rating organizations by the year of 1941 (A history of Standard & Poor’s, 2012).

S&P500 Stock Index, started to trade in the market on 4th March 1957 which apply the method of market-value-weighted index. In succession of Dow Jones Industrial Average, S&P500 has become the most watched indices in the world. S&P500 brought to a broader picture in the economic because it is comprised from the few main stock exchange in United State. The Standard and Poor’s 500 Index listed companies were the most held U.S.-based common stocks chosen by the committee, but not the 500 largest companies in the industries (A history of Standard & Poor’s, 2012).

Back over 200 years, a new market was formed to allow people to make more profits, which banks issuing shares of the company to raise money to finance their business. Besides that, to finance their country war, government also selling bonds, and government notes, promising to pay out at profit later. For over 20 years the trading was made on the street market before it moves indoors. The New York Stock Exchange Market was born as people started to realize that they could make more profits by selling the stocks to other parties in the secondary market. However, the New York Stock Exchange Market only allows large and well-established companies to trade in the market so that investors have a stable investment alternative. Due to the rapid growth in the market participants, Securities and Exchange Act was formed to safeguard the rights of investors (History of the New York Stock Exchange, 2010).

1.2 Problem Statement

In general, stock return and stock price are a key element of every public-listed company around the world. Stock return is a form of revenue that earned from the stock investment. It can be derived from changes of particular stock price. Well-established company normally was signified by high stock returns. With the availability of stock price, investor may obtain some information such as company stability. Once there is any unfavourable news associated with the company, investors will sell the stock and bid the stock price low. Thus, the company may face some crisis such as liquidation.

Stock return is an important element in which there are a few previous researchers who had done a several studies on the relationship between stock price and fundamental factors. Fundamental factors are any variables that used to explain the cross-sectional variation of stock return such as valuation factors, solvency factors and financial risk factors. As explained in CAPM, market beta is the merely explanatory variable in explaining cross-sectional variation of expected return.

However, Fama and French (1992) found that there is less association between average returns and beta over the period 1941 to 1960 and virtually no relation over the period 1963 to 1990. In addition, Fama and French (1992) introduced and found that two variable, size and book to market equity which can be applied to explain much of the cross-sectional variation in average stock returns. Chan, Hamao, and Lakonishok (1991) proved that book to market equity does well in explaining the cross-sectional of average returns on Japanese stocks. Instead of using market beta, Banz (1981) showed that cross-sectional of expected stock returns can be described well by using firm size.

Nevertheless, empirical contradictions were emerged among the results of numerous researchers. CAPM beta is not a single explanatory variable that completely explain the cross-sectional variation of expected returns and there is no clear direction from previous studies that which fundamental factors can capture the cross-sectional variation of stock prices with strongly, sufficiently and precise. Something more than the CAPM market beta and Fama and French (two factors -book-to-market and firm size ratio) may be needed to capture the cross-sectional variation of stock returns. But, which accounting variables are the most important here? Thus, there is an inevitable need to explore fundamental factors that explain the cross-sectional of stock price with current data.

1.3 Research Question

This study seeks answer to the following questions:

1. Is there any significant relationship between book-to-market equity and stock return?

2. Is there any significant relationship between firm size and stock return?
3. Is there any significant relationship between price to earnings ratio and stock return?
4. Is there any significant relationship between leverage and stock return?
5. Is there any significant relationship between earning volatility and stock return?
6. Is there any significant relationship between liquidity and stock return?

1.4 Research Objective

The purpose of this research is to investigate the impact of accounting variables toward the stock return empirically. The objectives of the study can be classified into general objective and specific objective.

1.4.1 General Objective

This research aims to provide meaningful information to company's managers or anyone who manage the company's portfolio, on which fundamental factors will significantly affect the stock return. Our results will be able to suggest them on which factors to look into to get an ideal stock return.

1.4.2 Specific Objective

The specific objective of our research is to examine the significant relationship between fundamental variables and stock return. We use factor analysis to extract common factors (hidden factors) out of a large number of observed variables. In other words, factor analysis incorporates a very large body of variables into a manageable set of factors to minimize our analysis.

1.5 Hypothesis of the Study

H₀: There is no significant relationship between book-to-market equity* and stock return.

H₁: There is significant relationship between book-to-market equity* and stock return.

H₀: There is no significant relationship between firm size* and stock return.

H₁: There is significant relationship between firm size* and stock return.

H₀: There is no significant relationship between price to earnings ratio* and stock return.

H₁: There is significant relationship between price to earnings ratio* and stock return.

H₀: There is no significant relationship between leverage* and stock return.

H₁: There is significant relationship between leverage* and stock return.

H₀: There is no significant relationship between earning volatility* and stock return.

H₁: There is significant relationship between earning volatility* and stock return.

H₀: There is no significant relationship between liquidity* and stock return.

H₁: There is significant relationship between liquidity* and stock return.

* All the above are factor variables to be extracted using SPSS.

1.6 Significance of the Study

This research is significant because financial accounting term is an indicator of the company's performance. It will directly impact the profit and loss of the stock returns. This study is about the financial accounting term on how to control the stock performance.

The contribution of this study is to incorporate large dataset comprising forty (approximate) variables into one single model. By using factor analysis to extract the common factors (latent variables) that we hope can explain stock returns. This dataset comprises of all the available accounting information in the market. Thus, it is a rather complete study. This paper helps the management of the company to better control the accounting terms in order to have a better performance. Thus, the stock market of the company will be stabilized and company can make profit by applying.

Besides that, this finding can also be used as a guideline for the future researcher and investor to review and construct a profitable portfolio.

1.7 Chapter layout

Chapter 1 – This chapter provides a terse description on the background of study, and explain the problem statement, research objectives, research questions, hypothesis and the significant of study.

Chapter 2 – This chapter focuses on the literature review. Previous studies on stock return and the four independent variables are discussed, as well as developing the research hypotheses.

Chapter 3 – This chapter describe the data sources and methodology use in this study. Besides that, research design, which talks about how the research is performed and methods of data analysis, is also explicated.

Chapter 4 – This chapter present the research results obtained from the methods used from the previous chapter. Analysis is carried out to obtain the findings for the research questions and hypothesis for the main purpose of the research.

Chapter 5 – This chapter will conclude the major findings of the research. Besides that, the implications and limitations are discussed. Recommendations for future researchers are suggested in this chapter.

1.8 Conclusion

This chapter has narrated the background of Dow Jones Economic Sentiment Indicator (ESI), S&P 500 Index, and New York Stock Exchange Market. Besides that, our research objectives and significance of study have been discussed in this chapter. The independent variables will be further discussed in Chapter 2.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter aimed to review the previous studies on how the stocks return behaviour impact by the fundamental variables. We have highlighted the empirical result of relevant accounting variables which include firm size effect, book to market ratio, leverage, price to earnings ratio, earning volatility and liquidity. Besides that, this chapter states the foundation model and theoretical framework that used to determine the stock return.

2.1 Reviews of the Literature

2.1.1 Dependent Variable - Stock Return

Stock return is a return on investment from stock, while stock price is a value of stock that stated in per unit basis. It is the cost that investor can buy and sell one unit share of stock on stock exchange. In financial and economic world, expertises always claim that stock price moves in random walks theory, which means that the trend of a stock is unpredictable. With association with the Efficient Market Hypothesis, stock price is believed to reflect all the information of the stock, or even the whole market. Thus, investors will have no chance to predict the stock future movements and history of past stock price movement cannot be used (Malkiel, 1973). In stock exchange, investors normally purchase shares in a lower price and sell it in a higher price at a later date. Stock price is used to calculate each investor's return. Stock return can be obtained and calculated by using selling stock price minus buying stock

price.

$$\text{Stock Return} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

In addition, stock return can be affected by several factors such as economic condition, brand awareness and development of a company. Thus, news available in the market will cause fluctuation of company's stock price.

2.1.2 Fundamental variables – Book-to-market equity

Numerous studies have documented the feasibility of using book-to-market equity to explain stock returns. The earlier studies can be traced back to 1980s. Stattman (1980), Rosenberg, Reid and Lanstein (1985), De Bondt and Thaler (1987) had found a positive relationship between stock returns and book-to-market equity in the US market. Moreover, Chan, Hamao and Lakonishok (1991) who conducted research in the Japanese stock market with dataset from January 1971 to December 1988 also revealed similar results. They applied Seemingly Unrelated Regression (SUR) model and managed to prove that book-to-market equity had a significant cross-sectional relationship with stock returns as it has a reliably positive impact on expected returns. Studies which carried out in UK and Hong Kong stock markets by Chan and Chui (1996) and Ho, Strange and Piesse (2000) had similar results.

Fama and French (1992) insisted that book-to-market equity has a good explanatory power for stock returns as it able to capture the cross-sectional variation in average stock returns over the 1963-1990 periods better than CAPM market beta (β). They suggested that stocks with high book-to-market equity have higher returns than stocks with low book-to-market equity (Fama and French, 1992, p. 429). This result is follow by Davis (1994), who studied with the data from Moody's Industrial Manual and University of CRSP. He proposed that book-to-market equity has ability to explain the cross-sectional

variation of stock returns significantly during the period from July 1940 to June 1962.

In addition, Pontiff and Schall (1998) proposed that book-to-market equity will be a superior explanatory factor of return when book value of equity serves as a better predictor of the future cash flow. This result is followed by Wang and Iorio (2007) as their research revealed that book-to-market equity is significantly priced at the 5% level. Lam and Spyrou (2003) also provide evidence that beta has weak explanatory power and book-to-market equity have a statistically significant relationship with average returns when small-firm effect has actually gone into reverse during the 1990s.

Last but not least, Morelli (2007) said that book-to-market equity is significant when the whole market is splitting into up and down market. By using three method approach (portfolio formation, portfolio beta estimation and testing), proposed by Fama and French, he conducted a research for 12 nine-year sub periods. Clubb and Naffi (2007) indicated that a portion of the cross-sectional variation in expected stock returns can be explained by a linear model which mingles the book-to-market equity with expectations of future book-to-market and return on equity.

So and Tang (2010) have conducted their research with Singapore data from January 1987 to December 1998, which collected from Pacific-Basin Capital Markets (PACAP) database. So and Tang (2010) have applied Ordinary Least Squares (OLS) regression and proposed that book-to-market equity alone is not significantly associated with stock returns and has weak explanatory power. This ratio becomes significant once it combined with market beta. They suggested that beta does not explain the cross-sectional of stock returns adequately and the joint effect of book-to-market equity and beta may be a surrogate as an underlying factor that is absent in the SLB model.

Nevertheless, there are some doubts regarding the validity of book-to-market

equity in explaining expected returns. Kothari, Shanken and Sloan (1995) suspected that some of the previous results were affected by selection bias and provide inaccurate evidence when researchers use COMPUSTAT data to conduct their book-to-market equity research. They failed to prove that stock returns were significantly affected by book-to-market equity. This result is contradicted with the finding of Fama and French (1992). In their research, they had done their research with the data from 1927 to 1990. By contrast, Barber and Lyon (1997) argued that survivorship bias in COMPUSTAT data does not have an effect on the book-to-market premium regardless of financial or nonfinancial firm. So, this indicated that book-to-market equity has an ability to explain cross-sectional variation in stock returns in a meaningful way. This result was supported by Kim (1997). He claimed that the positive relationship between expected returns and book to market equity is not extensively affected as the COMPUSTAT selection bias is not too severe.

Although large number of researchers showed a positive relationship between book-to-market equity and stock returns, there are several researchers suspect on the results. Levis and Liodakis (2001) who conducted their research in UK stock market failed to find such relationship. Artmann et al. (2012) found that there is no relationship between book-to-market equity and expected German stock returns. Furthermore, Loughran (1997) found that book-to-market equity is less efficient in explaining expected stock returns. He added that this ratio explain nothing on cross-sectional variation in returns for the three largest size quintiles during 1963 to 1965 while January was took out from the sample.

2.1.3 Fundamental variable – Firm size or market capitalization

Banz (1981) has proposed that stock return can be explained by using market capital or value. He also renamed the variable as size effect. The research paper was done on NYSE stock market return by CAPM model. The model shows that the size effect is significant in the smallest firms while is non linear for the larger firm. The small firm consist of insufficient intelligence about the assets and uncertainty of their performance and cause higher risk to the dealers consequently. Followed by risk-return trade off theory, stocks are usually considered in high risk high return. However, the result is not consistent and stable across the time. According to the report, firm size effect is exactly appear to affect the stock return, but there have an uncertain condition to impact the explanatory power of the variable.

The unconditional researches have been altered and in-depth study the relationship with condition circumstances. Although in different specific condition, majority of the researchers have found that firm size carried negative effect to stock return (Chui & Wei, 1998; Dhatt, Kim & Mukherji, 1999; Lau, Lee & McInish, 2002; Bollen, Clayton, Dempsey & Veeraraghavan, 2008; Senthilkumar, 2009; Roselee & Hon, 2009). Chui and Wei (1998) and Lau, Lee and McInish (2002) had done the research by using the same condition called turn-off-the-year to investigate the firm size effect. They had compared the January and non-January effect. According to Chui and Wei (1998) result the firm size effect is significant in Hong Kong, Korea, Malaysia and Thailand except Taiwan. These authors also find that Korea market had negative effect on stock return during January-effect. On the other hand, Malaysia and Thailand have negative effect on non- January months. Lau, Lee and McInish (2002) extended the similar studies to investigate the stock market of Malaysia and Singapore. The relationship showed that the two

countries have negative effect in non-January month which means that they are in weak seasonal behaviours.

Next, Dhatt et al (1999) examine the firm capitalization (market value) in Korea segmented market by three different circumstances. The first and second is test on whole period and separated period, the result state that there are negative effect but insignificant. Whilst, the third result determined stock return with stock quality categories, which is Section 1 and 2. The stock in the section is categorize by their trading period, capital size, profit and losses, financial ratio and etc. According to the finding in Section 1, there is an insignificant negative effect while it is significant in Section 2. Bollen et al (2008) have found a same result between firm size and Australia stock return. This research paper has noted the firm capitalization provide negative effect to the return of investment. They also mentioned that the effect is only significant in the smaller stock compare with larger firm.

In the addition, Roselee and Hon (2009) had combined the firm size with economics term to determine the relationship with the stock market examined the different firm size effects towards the stock market. They conducted their research with two parameter model and CAPM model suggested by Fama and MacBeth (1973). The results of their research have revealed that there is a negative relationship between firm size and stock return. The result has showed the smaller capital firm provides higher return as compare with the larger capital firm. However, Senthilkumar (2009) showed there is insignificant relationship between firm capitalizations and stock return in Indian market. The research is using the EGARCH approach to examine the variables based on the five main industries. He had used the simple and multiple regressions to determine the significance of firm size effect. Based on the result, the simple regression stated that firm size is significant in one industry while the multiple regressions show there is significant in two industries. Although there is negative relationship between firm size and stock

return in multiple regressions, size effect role has absorbed by other variable. When controlled other variables, the size effect is no longer importance to the cross section of stock return. This study has concluded the size effect is not importance to explain the stock return during year of 2000 to 2006 in Indian market.

On the other hand, firm size has affected Hong Kong stock return in positive way (Chui & Wei, 1998; Lam & Spyrou, 2003). According to Chui and Wei (1998) result, Hong Kong is positive effect on non-January effect. Besides that, another study done by Lam and Spyrou (2003) has found that the size effect is importance to explain the stock excess return for Hong Kong stock market. The positive effect shows that the larger firm is create more return than the smaller firm. This result had reversed the theory of small firm behaviour. Hassan and Javed (2011) have proved the same effect in Pakistan stock exchange. The paper is set to investigate the stock pricing during June of 1998 to June 2007. The small market value company is significant but it is insignificant for big market value company. They result is different with other country maybe is cause by the market pattern trend during year of 2005 and 2006.

2.1.4 Fundamental variables – Price to earnings ratio

Price to earnings ratio (P/E) refer as earning of common stock, which start to be concern and calculated for estimation stock price during 1950s. Basu (1977) is the first researcher access study between price to earnings ratio and stock return. According to the paper result, it state the lower ratio earn higher return than the higher price to earnings ratio. Recently, many researchers extended the study of the Basu (1977) statement.

The economic view of Federal Reserve Bank of Kansas City concludes that price earnings ratio (P/E) is negative significance indicator of US stock market. According to the article, the performance of the recent stock market trend to prove that high P/E ratio may cause the stock market in downturn (Shen, 2000). This report supported by Aga, Kocaman (2006) who had examines the P/E ratio by the tool of return index-20 and EGARCH model for Istanbul Stock market. Based on the result, it shows the P/E ratio is significant and carried negative effect to stock return. Hence, when the P/E ratio is low, it will provide higher return in the long term investment. Followed by Kyriazis and Diacogiannis (2007), this research had divided the analysis into two parts by using simple and multiple regressions with generalized least square (GLS) to test the argument about the stock and price-earnings relationship. Both regressions had show that the P/E ratio is negative effect towards stock return. This indicates that when the price-earnings ratio is low, the stock will outperform in the market.

Furthermore, Ordinary Least Square (OLS) is applied by Strugnell, Gilbert and Kruger (2011) to estimate the relationship between price-earnings between cross section stock return on Johannesburg Stock market. This research also shows negative effect of P/E to stock prices, but it will become weaken during the time across. Although P/E ratio is an importance indicator for short term stock return, it is also become useless when the time period is increasing. The result also agree by Bhargava and Malhotra (2006) and Rjoub, Yousef and Ananzeh (2010). Bhargava and Malhotra (2006) carried out their research by emphasizing on how the P/E ratio influences the different types of stock index. There are few types of stock index such as S&P 500, Morgan Stanley Composite index of world and Europe, African and Far East index. The investigation dataset is collected from 1980 to 2000, which is show in long term effect. At the same time, Rjoub, Yousef and Ananzeh (2010) enhanced the evidence in Egypt, Jordan, Morocco and Asaudi Arabia. It shows that the P/E ratio is insignificant power to explain the stock return. This

research uses the dataset which is start from December 1997 - July 2002.

Whilst, Lan (2012) has retorted the theory and argued stock price can be predicted by P/E ratio. He has done the research by using the Aspect FinAnalysis dataset from year of 1995 to 2004 in the Australia stock market. According to the result, this research paper is successfully found out the P/E ratio is insignificant to explain the increasing of P/E ratio will tend to the decreasing of stock return in the short term period. But, it is significant to explain and predict the stock return in the long term period. As an enhancement, we found that the significant negative relationship of P/E ratio and stock return had been objected by Liem and Basana (2012). According to the result, it stated with P/E ratio is not useful either in short or long term period. By the way, they are using five years data which within year of 2005 to 2010.

Last but not least, Michailidis, Tsopoglou and Papanastasiou (2007) had done the research on measure the E/P ratio affect on stock return during the period of 1997 to 2003 on Athens market. They obtained the data from Greek database. From the research, the simple regression formed by E/P variable is insignificant, which cannot explain the positive relationship with stock return. However, when the E/P combines with other variables, it will have positive relationship with stock return.

2.1.5 Fundamental variable – Leverage

The research of the effect of leverage ratios towards the stock return was first done by Bhandari (1988). By using the natural logarithm of total common equity (LTEQ) and weighted average estimates to perform the research from year 1948 to year 1979, the researcher found that there is a positive relationship between leverage ratios and stock return. The researcher

controlled the firm size and beta throughout the research to ensure that the leverage is the only factor to affect the stock return. These results are supported by the research done by Dhatt et al (1999) and Muradoglu and Sivaprasad (2008). Based on the research done by Dhatt et al (1999) in Korea from year 1982 to 1992, they found that there is a positive relationship between leverage ratios and stock return. The research was done by calculating the ratios.

On the other hand, Muradoglu and Sivaprasad (2008) get a different result from the other researchers. The data used covers from year 1980 until 2004. By using linearity test for leverage, GMM estimators and fixed effect for firms when running the regressions, they found that there is a negative relationship between leverage ratios and stock returns wherefore the firm have the opportunity to get cheap debt, while the firm in turn making a huge profit. However, there are also a few researchers that found a different result in their research. The research done by Kallunki and Martikainen (1996), by using the cumulative time-series of the estimated monthly regression coefficients for the year 1975 until 1989, shows the results that the stock return of Finnish firms will decrease when the firms leverage increases. The situation happens because the Finnish firms apply debt financing methods as the interest rates were low, which encourages the firms borrow more.

Moreover, Chelley-Steeley and Steeley (2005) studies the effect of leverage ratios on UK stock market, using the methods of GARCH family of statistical processes and maximum likelihood estimates. The data was obtained weekly from year 1976 until 2001. As a result, there is a negative relationship between stock return and the leverage ratios. The increase in leverage brought to the increase of risk and expected return of equity, which causes the decrease of the price of equity. The study of Obreja (2006) also shows that firms which are highly leveraged faced higher risk as they have to maintain their productions, and at the same time, there must be no increase in default.

By estimating the variants of the baseline regression model, the results from the research done by Ghosh (2008) referring to India for the year 1995 until 2004, shows that high leverage of firms might execute the market discipline though some debts might help. Besides that, high leverage might also lower the earning of firms. The reason behind is due to the expansion of operations using debt, while large firms does not gain return as ideal.

Bhatti, Majeed, Rehman and Khan (2010) applied statistical methods in their research to determine the leverage ratios in several industries in Pakistan for the year 2005 until 2009. The results show that the high level of leverage causes the stock price to fickle which may lead to low stock returns in long run. The research done by Cai and Zhang (2010) also support that the increase in the leverage ratios will have a negative impact on the stock returns. The samples used are for the duration from 1975 until 2002 and the method used for the research is the cross-sectional regressions, which is used to test on the effects of changes on leverage ratios and the stock returns.

By referring to the research done by Kose (2011), the results shows that short term leverages will brought to a high stock returns. However, long term leverages will lead to lower stock returns. The author regress the model by using CAPM market factor, Fama-French three-factor model, and the Carhart four-factor model while the samples covering from year 1974 until 2009. The reason for short term debt lead to a higher stock returns is because firms with more short term debt will get higher expected returns as short term debt are priced negatively.

2.1.6 Fundamental Variables – Earning Volatility

Earning component seldom used for estimation of stock return, due to the area involved widen and consist of different characteristics of different company. Normally, company management team will determine their earning price by considering on earning surprise, smoother earning or earning quality (Hunt, Moyer & Shevlin, 2000; Wei & Zhang, 2006; Rajgopal & Venkatachalam, 2006; Roodposhti & Valipoor, 2011; Apergis, Eleftheriou, & Sorros, 2012). Hence, there had some study research argued the earning role for the explanation of stock return.

The earlier study of Haugen and Baker (1996) did the research in US stock market which contains 3000 number of stock with year of 1979 and 1993. The population stocks categorize according to the factor characteristics and run it by OLS regression. They success found out the earning is positive effect on stock return as means the company more profitable, the stock expected return increased accordingly. However, it is insignificant in the cross section regression. The result was supported by Kothari, Lewellen and Warner (2003). They argued the stock return was impacted by earning news and positive insignificant of the past earning volatility. In the paper, it had stated the firm earning affected by many condition such as earning surprise, discount rate and business. They test on NYSE, AMEX and NASDAQ stock start from the year of 1970 until 2000. Based on the regression autocorrelation lag, it conclude that positive correlated is inconsistent due to the earning data is not the pure from the firm account.

Nevertheless, some researchers have opposed the result of insignificant relationship between the stock return and earnings (Huang, 2004; Bali, Demirtas & Tehranian, 2008; Roodposhti & Valipoor, 2010). Huang (2004) examined the relationship between earning volatility and stock return by the capital asset pricing, Fama and French (1992) and multifactor model.

According to major finding, it show the earning is significant and carried positive related in portfolio but opposite on individual company level. The positive relation was related and affected by size effect.

Besides that, Bali et al (2008) did the study about relationship between the earning and stock return start from 1973 that minimum had thirty number of observation. The Fama model had been used as a basic theoretical model and OLS approach to run the result. They group the earning level by systematic and unsystematic component; the result had shown the unsystematic part is significant while systematic is insignificant to explain the return of the stock. The cross section regression also had shown the earning carried positive impact for it accordingly. Lastly, Roodposhti and Valipoor (2010) investigate the earning volatility by divided it into short and long period. The stock population is from Tehran stock exchange within 2003 and 2008. According to the WALD test, it shows the short term volatility consists of positive impact on stock return. Whilst, the long term volatility had negative impact to the return.

2.1.7 Fundamental Variables – Liquidity

Liquidity of the company was playing a main role for the company performance benchmark. According to the previous researchers, Datar et al (1998) had shown the significant of liquidity to explain stock returns as well as it is negative relationship. Instead of using liquidity, this researcher is emphasizing on turnover rate. However, this method has served as a substitute test for A&M's model. It explains the 1% drops in the turnover rate will be affecting the rising of 4.5 basis points per month in the stock return. Besides, it is also found that it did affected by January effect, which is means that liquidity is able to explain stock return in the month of January even the

rest of the year. This paper was supported by Amihud (2002), Ang, Hodrick, Xing and Zhang (2006), Chang, Faff and Hwang (2009), Huang (2009), Omri, Zayani and Loukil (2010).

Amihud (2002) ran his research using Fama and Macbeth (1973) method and found out that there is a negative relationship between liquidity and ex ante stock excess return. The data was obtained for the year 1973 until year 1997 from daily and monthly databases of Center for Research of Security Prices of the University of Chicago (CRSP). The reason of the findings is due to the aggressive investments in illiquid stocks for higher risk premium. In the addition, Omri, Zayani and Loukil (2010) had done the research on the effect of liquidity towards the stock returns of Tunisian firms that stated in Tunis Stock Exchange (BVMT). This research is using monthly data which is extracted from year 1998 to 2003 with cross-sectional regression. Based on the result, there is negative relationship between liquidity and stock returns. Hence, the less liquidity will have high return as an outcome. In addition, this research also found that there is not seasonal but continuous effect on liquidity towards stock returns.

In the research of Chang et al (2009), it shows the significant and negative relationship on liquidity and stock returns. Moreover, there is a result of the impact level of liquidity towards stock returns would be enhanced by controlling on liquidity variability. This research is study on the impact liquidity against the stock returns in Japan. Well, the data is employs from the First Section, Second Section, and Mothers Section of Tokyo Stock Exchange (TSE). Furthermore, by using the method of Fama-French four factors, Huang (2009) carry out his research for the year 1973 to 2004. The results found that there is strong and consistent negative relationship between historical cash flow volatility with ex-post stock return. This is because cash flow volatility is a proxy of return volatility, and systematic and idiosyncratic return volatility have negative relationship with return. This result is supported by Ang et al.

(2006).

However, there are a few researchers found a different result in their research. According to Jun, Marathe and Shawky (2002), the research is focuses on the reaction of liquidity towards the stock returns in both cross-sectional and time-series analyses. The data is extracted from 27 emerging equity market as well as in the period January 1992 to December 1999. At the same time, a measurement on using turnover ratio, trading value, and turnover-volatility multiple is carry out. From the result, a positive relationship is found in both cross-sectional and time-series analyses. Besides, the result in cross-sectional analysis also mentions the view of emerging equity markets have a lower degree of integration with the global economy.

Based on Bollen et al (2008), the research is determined on the effect of several accounting variables against stock returns in Australian. Those accounting variables are included company size, stock beta, liquidity, and idiosyncratic volatility. Then, the result had shown there is positive relationship between liquidity and stock return which means a high liquidity will associate with high stock returns. Hirshleifer, Hou and Teoh (2009) decomposed cash flow into accruals and actual cash flow by using the method of univariate regression to run the dataset from 1965 to year 2005. The study found that accruals component carried negative return to company while actual flow in of capital was positive impact to their return. They had proved the changes of the accruals information and method, it will cause to depreciate the value of return.

2.2 Theoretical model

2.2.1 Capital Assets Pricing Model (CAPM)

Risk-return tradeoff is a main tenet in the financial world. So and Tang (2010) stated out that foundation for quantification of the relationship between risk and return has been laid by Markowitz in year 1959. In response to the awareness of the significance of risk-return tradeoffs, Sharpe (1964) has first proposed a Capital Asset Pricing Model (CAPM) and thereafter completed by another two researchers, Linter (1965) and Black (1972). Based on the Markowitz's mean-variance model, CAPM was built. Morelli (2007) mentioned that CAPM indicates a positive relationship exists between non-diversifiable market risk and expected return on a security, with the condition that the market risk premium must be positive. He added that CAPM assumes market beta is the only significant independent variable to explain the stock returns. The formula of CAPM model is as follow:

$$E(r_i) = R_f + \beta_i(E(r_m) - R_f)$$

$E(r_i)$ = return required on financial asset i

R_f = risk-free rate of return

β_i = beta value for financial asset i

$E(r_m)$ = average return on the capital market

In finance world, CAPM is widely served as a way to value risky asset and estimate the cost of capital for firms. The model takes into account the non-diversifiable risks, the market expected return, and the expected return of risk free assets. In addition, CAPM acts as a point of reference for performance of managed portfolio evaluation. It describes the relationship between required rate of return and market risk by using security market line (SML).

In the early stage, many researchers done their studies based on this framework. Most of the researchers managed to obtain same empirical results that consistent with the statement of CAPM. Black (1972), Fama and MacBeth (1973), done the research able to find a significant positive relationship between systematic risk and expected return on a securities. Thereafter, there is also a group of researchers began to raises doubt on the validity of CAPM. This is based on the argument that the positive relationship between risk and return on a security is too flat, although there is a positive relationship between risk and return.

2.2.2 Arbitrage Pricing Theory (APT)

Fama and French (1992) stated that beta has only little explanatory power in explaining US stock returns. Furthermore, researchers managed to prove other independent variables (firm size, book to market equity and etc) have stronger explanatory power than market beta as proposed by CAPM. Hence, during year of 1976, a new model had been developed by Cox and Ross (1976) which is Arbitrage Pricing Theory (APT). Cox and Ross (1976) had revised and extended the theory of CAPM model, predicted the stock return and shows linear relation with expected return and risk. It is known as multi-factors model which can compared more than one factors to analyze explanatory power of the variable to stock performance. APT model described in factor model, it state there is no law of one price theory into the model. The factor model has a low risk as it can be diversified by the securities consist. Company are making higher revenue with the diversified portfolio (Huberman & Wang, 2005). The formula of the theory is as follow:

$$R_t = E_t + b_{i1}\delta_i + b_{i2}\delta_i + \dots + b_{ik}\delta_k + \varepsilon_i$$

R_t = expected return of security

E_t = slope of the equation

b_{ik} = factors used to explain the expected return

δ_k = sensitivity to each factor

ε_i = error term

Multi-factor models commonly had categories into macroeconomics, microeconomics, fundamental and statistical models. Roselee and Hon (2009) had displayed the APT model to determine the macroeconomic factors that significant impact the stock returns. Moreover, Chang et al (2010) demonstrates the APT model by used the factors of liquidity and business cycle to run the result and it shows there is significant to explain the stock return. However, the model does not tell us what are the relevant factors significant explain to expected return. The whole model maybe will explore the correlation problem in the equation.

2.3 Theoretical framework

We had demonstrated the CAPM and APT model to form our own model. The paper main study was explained how the fundamental variables affect the stock returns. We had determined the fundamental variables as factors in the model by factor analysis technique, which will be discussed in Chapter 3 and 4. Based on the previous study, the common fundamental variables are firm size effect (FIRMSIZE), book to market ratio (BMR), leverage (LVR), price to earnings ratio (P/E), earning volatility (E) and liquidity (LQD). We had revised it and formed the temporary econometrics model before run the factor analysis.

The econometrics model:

$$\text{Stock Return} = \beta_0 + \beta_1 \text{ FIRMSIZE} + \beta_2 \text{ BMR} + \beta_3 \text{ LVR} + \beta_4 \text{ P/E} + \beta_5 \text{ E} + \beta_6 \text{ LQD} + \varepsilon_i$$

2.3.1 Firm Size/ Market Capitalization

Firm size known as a method that uses for classify the company through size. So, it is divided into four categories which are micro business, small business, medium-sized business, and large-sized business. According to firm size may get influence on the tendency of stock return whether upward or downward, many investors will evaluate the size of the company before making any investment. Mostly, those investors are observing on the background or performance of a specific company. Well, the bigger size of the company, the more information provided as well as low risk. From our a-priori expectation, we rely on the tradeoff theory as high risk will tend to high return. It is means that the small firm size is able to general higher stock returns. Hence, there is negative relationship between firm size and stock returns.

2.3.2 Book-to-market ratio

Book-to-market ratio compares the book value and the market value of a specific company in order to investigate whether the stocks are in the undervalued or overvalued. So, the stocks will be allocated in undervalued if the ratio is greater than 1, while the stocks will be allocated in overvalued if the ratio is smaller than 1. This is also shows the way on how the company is priced by the market as well determines the worthiness of the company. From our a-priori expectation, according to the high book-to-market is proving the company is undervalued, it is enough evidence to show its impact on stock

returns. Well, high book-to-market can lead to the high inflow of investing due to those investors believe that will be potential growth in the future time. Therefore, there is a positive relationship between book-to-market and stock returns.

2.3.3 Leverage

Leverage is a financial ratio which can be also called as debt-to-equity ratio. It normally expressed as total liabilities over shareholders equity. This ratio indicated the relative proportion of equity and debt that the company use to finance its assets or short term capital. Meanwhile, the prior fiscal year data is uses during the calculation. Leverage is used by those investors in predicting the stock returns with the purpose to gain profit. Undeniably, the higher leverage will tend to the more risky to investing in the company. But, it also shows the larger return with high leverage. It is because the company is using more liabilities compare to its equity to expand its sales and earnings. From our a-priori expectation, the higher stock returns is based on the high leverage which is associated with the tradeoffs theory. So, there is positive relationship between leverage and stock returns.

2.3.4 Price-to-earnings ratio

Price-to-earnings ratio (P/E) determines the price that willing to pay by those investors to invest in a share of specific company. It is also stated as a very useful tool to provide for those investors to make assessment on the potential movement of stock return.. However, this comparison is only available for those companies that are within the in the same industry. This is because investors would not get confidence to invest in the company that get the low

P/E ratio and it will tend to the low earnings growth. So, there is positive relationship between P/E ratio and stock returns. Investors will preferably and consider investing in Company which have high P/E ratio rather than low P/E ratio, this is an indicators which show potential investors and analyst confidence to the Company in able to generate higher return in the foreseeable future.

2.3.5 Earning Volatility

Earning volatility can be defined as the fluctuation of the company's revenue. So, the past earning records are not reliable and helpless for those investors as it cannot find out the accuracy trend of the earning movement. From our a-priori expectation, there is positive relationship between earning volatility and stock returns. It is because the earning of a company in high fluctuation has the larger movement compare to the earning of a company in the low fluctuation. Although the earning is moving downward in the past period, it has a high possible to moving upward in current period. Since, investors to seek for high return will choose to invest in the company that carries high earning volatility.

2.3.6 Liquidity

Liquidity ratio shows company's capability in meeting its short-term debt and obligation. This ratio also reveals whether the company can convert asset into cash quickly. Obviously, the higher liquidity associated with the higher ability of the company to repay the short term debt. It is means the high liquidation of the company as well as the asset in the company is greater than the liabilities in the company. So, the company is able to use the assets to cover the debt at

any emergency time. From our a-priori expectation, there is negative relationship between liquidity and stock returns. Based on the tradeoff theory, low liquidity is place with the high risk situation as the company would face the crisis of bankruptcy or lack of fund. Hence, it will require high return when the company is in illiquidity.

2.4 Conclusion

This chapter highlighted the previous researcher empirical result and the theoretical model. The explanatory power of independent variables (fundamental variable) to dependent variable (stock return) has been stated and determined. The expected sign of the variables had been shown depend on the nature direction in financial world. Next, we will discuss how to conduct the research and discuss the detail of factor analysis which helps determine the factors to build the new model in Chapter 3.

CHAPTER 3: METHODOLOGY

3.0 Introduction

Methodology plays an important role in the research as there is a relationship between research results. Well, the correct way in using methods can enhance the reliability of the research result. In this chapter, a number of methods are used to examine the impact of fundamental variables against stock returns. At first, S&P 500 is the main source to extract the company year-end account and stock return in this study. Next, the data cleaning is also carried out to standardize the data. From the econometric method, we are using SPSS statistics and Ordinary Least Square (OLS) to run regression which are allocated in a cross-section approach. After that, diagnostic checking is held with multicollinearity and Jarque-Bera normality test.

3.1 Research Design

Research design defines as the structure of research study with the purpose to reach a conclusion or answer in a set of questions. Thus, collecting and analyzing data are required to obtain desired information. Besides, research design is also known as the blueprint of the study with the details on how the study is constructed (Kenneth, n.d.).

3.1.1 Quantitative Research

Quantitative research is the findings that express or evaluate in numerical form to explain in a particular phenomenon. Looking at it from another angle, it is employs in mathematically based method to determine the relationship or cause-and-effect between those independent and dependent variables. Generally, quantitative research is applied in this study as OSL is using to determine the impact of fundamental variables against stock returns.

3.2 Data Sources and Descriptive

Secondary data is the data that obtaining through other resources or other researchers with the different purpose. It is also identified as historical data since it gathered all the past reports and summarizes it as well. In this study, secondary data is used due to all the data are downloaded from Data Stream in UTAR library. It is cheaper and less time consuming compare to primary data. In addition, the accuracy of secondary data is higher. Generally, the population of this study are public traded companies in S&P 500. Associated with the reason, it is a large cross section to represent U.S stock market like Dow Jones (Dow Jones economic sentiment indicator overview, n.d.) and best benchmarks in order to evaluate the performance of U.S. market as well (Management Study Guide, 2012).

In this study, total numbers of 310 companies in S&P 500 are selected with the collected on yearly basis for the period time of 12 years from 1999 until 2010. Besides, the year end accounts of these companies in S&P 500, as well as the stock price are extracted from data stream in UTAR library. However, the formula to calculate stock return is shows at below:

$$\frac{P_t - P_{t-1}}{P_{t-1}}$$

3.2.1 Data Cleaning

Initially, all public traded companies in S&P 500 that did not fulfill within years requirement that set at the first are removed. Next, public traded companies with the lack of information also eliminated from the list. Matching data year by year through all public traded companies is held to ensure the standardization of data without any data biased. Well, this action can be increase the accuracy of this study.

3.3 Econometric Model

The econometric model is still remaining same with the equation of chapter 2. The factor analysis progress will be discussed in chapter 4 and reform a new model.

$$\text{Stock Return} = \beta_0 + \beta_1 \text{FIRMSIZE} + \beta_2 \text{BMR} + \beta_3 \text{LVR} + \beta_4 \text{P/E} + \beta_5 \text{E} + \beta_6 \text{LQD} + \varepsilon$$

Where FIRMSIZE is total market value of the company, BMR is book-to-market ratio which is book value of the company, LVR is leverage which is refer the debt to equity ratio of company, P/E is prices to earnings ratio which is company's share price compare to share earnings, E is earnings volatility and LQD is liquid of the assets. ε is an error term uncorrelated with FIRMSIZE, BMR, LVR, P/E, E, LQD and $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are parameters to estimate.

3.4 Econometric Method

In this research, our research economics model is build with the cross-section approach. This approach is determining the factor effecting on many company and with a specific time period. The advantage is we can capture the seasonal, January effect and any special pattern trend that affect our research result. This first research objective is grouping and figure out the correlation within all fundamental accounting

variables by factor analysis. Next part of the research is investigated how they affect return of S&P 500 index by ordinary least square (OLS) method.

3.4.1 Factor Analysis

Factor analysis is a data reduction tool that helps to extract common factors (latent factors) out of a large body of observed variables. In the factor analysis procedure, there are seven methods of factor extraction, five method of rotation and three methods of computing factor scores. Different method will provide different point of view for researchers. To make a large number of variables into a manageable set of factors, we have specified the methods of descriptive, extraction, rotation, factor scores and etc from the options available.

Steps of performing factor analysis:

i) Descriptive

We have selected initial solution for statistics and significant levels and Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity for correlation matrix in the descriptive window. Initial solution was act as a role of showing communalities, eigenvalues and the percentage of variance explained for us to review. KMO is used in our research to check whether partial correlation among variables is small. To test the appropriateness of factor analysis, Bartlett's Test of Sphericity is used. The test is done by examining whether the correlation matrix is an identity matrix (Factor Analysis Descriptives, n.d.).

ii) Extraction

We have fixed the extraction method as our principal component. Principal component is one of the extraction methods that applied to form uncorrelated linear combinations of the variables. For the eigenvalues, we have adjusted its value exceed than one. Eigenvalues embody the total variance explained by each factor. Besides, we applied natural loading for our dataset as we do not specify the number of factors that will be generated. We also selected correlation matrix out of analyse options and unrotated factor solution and scree plot for display purpose. A scree plot helps us to decide the number of factor that should be kept as it is a plot of the variance against the number of factors. (Factor Analysis Extraction, n.d.).

iii) Rotation

Orthogonal Rotation

This rotation method is applied when factors are expected to uncorrelated. With this method, interpretability of the factors normally can be easy and enhanced. The examples of orthogonal rotation are as below: (Factor Analysis Rotation Method, n.d.)

➤ **Rotation Varimax**

It categories in an orthogonal rotation associated with the meaning of factors are independent. It is the most commonly rotation that always used by researchers. The function of Varimax is to maximize the variance of the squared factors loading in each factor. Well, this can help to extract the factor from the original variables so that each factor will only group with few variables. Obviously, Varimax reduce the complexity and easy to identify.

➤ **Rotation Quartimax**

It is also categories in an orthogonal rotation as Varimax. However, the function of Quartimax is to maximize the variance of the squared factors loading in each variable. Therefore, there will be more than one factor group in each variable. It is more complexity and hard to define, so Quartimax is less to used compare with Varimax.

➤ **Rotation Equamax**

It has the same category as an orthogonal rotation too. It is the compromise between Varimax and Quartimax due to it combines the criteria of both rotations. In Equamax, maximize or minimize the variance of the squared factors loading in each variable is excluded. In addition, it is used only when there are clearly identified factors is stated (Reiley, n.d.).

Oblique Rotation

This rotation method normally will be applied when the factors are likely to be correlated. The interpretability of the factors is complex than the orthogonal rotation. The examples of oblique rotation are Direct Oblimin and Promax (Factor Analysis Rotation Method, n.d.).

We employed varimax as our rotation method in the rotation window. This is because it has gained popularity from the researchers.

iv) Scores

We have selected one of the functions (save as variable) in the scores window. This function allows us to save the factor scores obtained for our future use.

v) Options

We allow the missing values to keep default as exclude cases listwise in the option window. For coefficient display format, we adjusted the suppress absolute values less than 0.45.

3.5 Diagnostic Checking

We are using the OLS approach to run the regression. Before we move on to model estimation, it is necessary to provide a diagnostic checking for the model.

3.5.1 Multicollinearity

Multicollinearity is one of the econometric problems, which occur when there is perfect or exact linear relationship among independent variables of a regression model (Gujarati & Porter, 2009).

In order to identify the seriousness of the impact of multicollinearity, variance-inflating factor (VIF) is used. It shows the impact by presenting in number from 1 until infinite, the high VIF which represents the seriousness of multicollinearity.

3.5.2 Jarque-Bera

Jarque-Bera (JB) normality test is to determine how likely the data is to be normally distribution. At the same time, classical skewness and kurtosis coefficient are uses in JB normality test. The formula of the test is shows as below:

$$JB = \frac{n}{6} \left(S^2 + \frac{1}{4}k - 3 \right)^2$$

In the procedure, null hypothesis (H_0) and alternative hypothesis (H_1) are used as the assumption in the test which is shown as below:

H_0 = Error term is normally distributed

H_1 = Error term is not normally distributed

Based on the P-value result, reject H_0 if the P-value is <0.01 , which means that the error term is not normally distributed. In contrast, do not reject H_0 if the P-value is >0.01 , which means that the error term is normally distributed.

3.6 Conclusion

In brief, this chapter has discussed the methodology that is used in our research such as data sources and descriptive, econometrics model and method, diagnostic checking as well. Next, all the results in our research and interpretation will be shown as well as explained in detail in chapter 4.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter is discussing on the results obtained, on which accounting factors will affect the stock price changes. The results obtained from the factor analysis method will be presented. Besides that, Ordinary Least Square method is also used to find out the relationship of the variables. The outputs of the test will be commentated.

4.1 Factor Analysis

From the results of the rotated component matrix as (shown in Table 4.1.1 until Table 4.1.11 in appendix), factor analysis has group all the similar components under a same factor. Thus, we renamed the factors according to the components obtained. The economic models for the years are as follow:

$$\begin{aligned} \text{Stock Return of 2000} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &\quad + \beta_4 \text{ Preference Capital} + \beta_5 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2001} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &\quad + \beta_4 \text{ Extraordinary} + \beta_5 \text{ Cash Flow} + \beta_6 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2002} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &\quad + \beta_4 \text{ Preference Capital} + \beta_5 \text{ Cash Flow} \\ &\quad + \beta_6 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2003} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &\quad + \beta_4 \text{ Current Assets} + \beta_5 \text{ Preference Capital} \\ &\quad + \beta_6 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2004} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &+ \beta_4 \text{ Extraordinary} + \beta_5 \text{ Preference Capital} \\ &+ \beta_6 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2005} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} + \beta_4 \\ &\text{Preference Capital} + \beta_5 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2006} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &+ \beta_4 \text{ Extraordinary} + \beta_5 \text{ Current Assets} \\ &+ \beta_6 \text{ Preference Capital} + \beta_7 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2007} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &+ \beta_4 \text{ Current Assets} + \beta_5 \text{ Market-to-Book} \\ &+ \beta_6 \text{ Preference Capital} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2008} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings I} \\ &+ \beta_4 \text{ Earning II} + \beta_5 \text{ Preference Capital} \\ &+ \beta_6 \text{ Market-to-Book} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2009} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings I} \\ &+ \beta_4 \text{ Earnings II} + \beta_5 \text{ Current Assets} + \beta_6 \text{ Preference Capital} \\ &+ \beta_7 \text{ Extraordinary} + \varepsilon_i \end{aligned}$$

$$\begin{aligned} \text{Stock Return of 2010} &= \beta_0 + \beta_1 \text{ Firm Size I} + \beta_2 \text{ Firm Size II} + \beta_3 \text{ Earnings} \\ &+ \beta_4 \text{ Earnings II} + \beta_5 \text{ Current Assets} + \beta_6 \text{ Preference Capital} \\ &+ \varepsilon_i \end{aligned}$$

Firm Size I : Size of companies categorized for government statistic use.

Firm Size II : Another measure of size of companies categorized for government statistic use.

Earnings I : A factor variable combining same variables which measure earnings-related ratios.

Earnings II : Another factor variable combining same variable which measure earnings-related ratios.

Preference Capital : Company stock with dividends paid to shareholders before common stockholders.

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Market-to-Book : The value of company by comparing the book value to market value.

Extraordinary Items : A measure item that contribute to extraordinary profits.

Cash Flow : Amount of money flowing inwards and outwards of a business.

Current Assets : All assets that are can be converted for cash in within one year.

Tables below shows the results for total variance explained in each year. By looking at the rotation sums of squared loadings cumulative percentage, the results shows that more than 83% of the variances are accounted for by the factors in each year.

Table 4.1.12: Result of Total Variance Explained for year 2000

| Total Variance Explained | | | | | | | | | |
|---------------------------------|----------------------------|----------------------|---------------------|--------------------------------------------|----------------------|---------------------|------------------------------------------|----------------------|---------------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.585 | 66.478 | 66.478 | 28.585 | 66.478 | 66.478 | 18.010 | 41.885 | 41.885 |
| 2 | 4.973 | 11.565 | 78.042 | 4.973 | 11.565 | 78.042 | 13.746 | 31.967 | 73.852 |
| 3 | 2.793 | 6.495 | 84.538 | 2.793 | 6.495 | 84.538 | 4.294 | 9.986 | 83.838 |
| 4 | 1.436 | 3.340 | 87.878 | 1.436 | 3.340 | 87.878 | 1.697 | 3.947 | 87.784 |
| 5 | 1.123 | 2.611 | 90.489 | 1.123 | 2.611 | 90.489 | 1.163 | 2.705 | 90.489 |

Table 4.1.13: Result of Total Variance Explained for year 2001

| Total Variance Explained | | | | | | | | | |
|---------------------------------|----------------------------|----------------------|---------------------|--------------------------------------------|----------------------|---------------------|------------------------------------------|----------------------|---------------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.128 | 65.414 | 65.414 | 28.128 | 65.414 | 65.414 | 16.333 | 37.983 | 37.983 |
| 2 | 4.620 | 10.744 | 76.157 | 4.620 | 10.744 | 76.157 | 14.603 | 33.961 | 71.944 |
| 3 | 3.305 | 7.687 | 83.844 | 3.305 | 7.687 | 83.844 | 3.403 | 7.913 | 79.858 |
| 4 | 1.388 | 3.227 | 87.071 | 1.388 | 3.227 | 87.071 | 2.157 | 5.017 | 84.874 |
| 5 | 1.235 | 2.872 | 89.944 | 1.235 | 2.872 | 89.944 | 2.138 | 4.972 | 89.846 |
| 6 | 1.029 | 2.394 | 92.338 | 1.029 | 2.394 | 92.338 | 1.071 | 2.492 | 92.338 |

Table 4.1.14: Result of Total Variance Explained for year 2002

| Total Variance Explained | | | | | | | | | |
|---------------------------------|----------------------------|----------------------|---------------------|--------------------------------------------|----------------------|---------------------|------------------------------------------|----------------------|---------------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.752 | 66.866 | 66.866 | 28.752 | 66.866 | 66.866 | 19.069 | 44.346 | 44.346 |
| 2 | 4.386 | 10.201 | 77.066 | 4.386 | 10.201 | 77.066 | 12.894 | 29.987 | 74.333 |
| 3 | 2.594 | 6.032 | 83.098 | 2.594 | 6.032 | 83.098 | 2.930 | 6.814 | 81.147 |
| 4 | 1.660 | 3.859 | 86.958 | 1.660 | 3.859 | 86.958 | 1.841 | 4.281 | 85.429 |
| 5 | 1.127 | 2.621 | 89.578 | 1.127 | 2.621 | 89.578 | 1.684 | 3.915 | 89.344 |
| 6 | 1.009 | 2.347 | 91.926 | 1.009 | 2.347 | 91.926 | 1.110 | 2.582 | 91.926 |

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Table 4.1.15: Result of Total Variance Explained for year 2003

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.316 | 65.851 | 65.851 | 28.316 | 65.851 | 65.851 | 23.228 | 54.018 | 54.018 |
| 2 | 4.627 | 10.761 | 76.611 | 4.627 | 10.761 | 76.611 | 7.025 | 16.338 | 70.356 |
| 3 | 2.818 | 6.554 | 83.165 | 2.818 | 6.554 | 83.165 | 3.420 | 7.955 | 78.311 |
| 4 | 1.670 | 3.883 | 87.048 | 1.670 | 3.883 | 87.048 | 2.901 | 6.746 | 85.056 |
| 5 | 1.143 | 2.659 | 89.707 | 1.143 | 2.659 | 89.707 | 1.763 | 4.100 | 89.156 |
| 6 | 1.032 | 2.401 | 92.108 | 1.032 | 2.401 | 92.108 | 1.269 | 2.952 | 92.108 |

Table 4.1.16: Result of Total Variance Explained for year 2004

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.466 | 66.200 | 66.200 | 28.466 | 66.200 | 66.200 | 26.070 | 60.627 | 60.627 |
| 2 | 4.535 | 10.547 | 76.747 | 4.535 | 10.547 | 76.747 | 5.246 | 12.200 | 72.828 |
| 3 | 2.300 | 5.349 | 82.096 | 2.300 | 5.349 | 82.096 | 3.794 | 8.822 | 81.650 |
| 4 | 2.128 | 4.949 | 87.044 | 2.128 | 4.949 | 87.044 | 2.181 | 5.072 | 86.721 |
| 5 | 1.184 | 2.753 | 89.797 | 1.184 | 2.753 | 89.797 | 1.210 | 2.814 | 89.535 |
| 6 | 1.017 | 2.366 | 92.163 | 1.017 | 2.366 | 92.163 | 1.130 | 2.627 | 92.163 |

Table 4.1.17: Result of Total Variance Explained for year 2005

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 29.324 | 68.196 | 68.196 | 29.324 | 68.196 | 68.196 | 19.471 | 45.280 | 45.280 |
| 2 | 4.223 | 9.821 | 78.017 | 4.223 | 9.821 | 78.017 | 12.772 | 29.702 | 74.982 |
| 3 | 2.189 | 5.092 | 83.109 | 2.189 | 5.092 | 83.109 | 3.380 | 7.860 | 82.842 |
| 4 | 1.253 | 2.914 | 86.023 | 1.253 | 2.914 | 86.023 | 1.284 | 2.987 | 85.829 |
| 5 | 1.117 | 2.597 | 88.620 | 1.117 | 2.597 | 88.620 | 1.200 | 2.791 | 88.620 |

Table 4.1.18: Result of Total Variance Explained for year 2006

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 27.871 | 64.816 | 64.816 | 27.871 | 64.816 | 64.816 | 19.818 | 46.089 | 46.089 |
| 2 | 4.567 | 10.622 | 75.438 | 4.567 | 10.622 | 75.438 | 10.555 | 24.546 | 70.635 |
| 3 | 3.004 | 6.986 | 82.425 | 3.004 | 6.986 | 82.425 | 3.291 | 7.653 | 78.288 |
| 4 | 1.706 | 3.966 | 86.391 | 1.706 | 3.966 | 86.391 | 2.516 | 5.851 | 84.139 |
| 5 | 1.182 | 2.749 | 89.140 | 1.182 | 2.749 | 89.140 | 2.029 | 4.718 | 88.856 |
| 6 | 1.116 | 2.595 | 91.735 | 1.116 | 2.595 | 91.735 | 1.192 | 2.772 | 91.629 |
| 7 | 1.084 | 2.521 | 94.256 | 1.084 | 2.521 | 94.256 | 1.130 | 2.627 | 94.256 |

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Table 4.1.19: Result of Total Variance Explained for year 2007

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.025 | 65.175 | 65.175 | 28.025 | 65.175 | 65.175 | 16.413 | 38.170 | 38.170 |
| 2 | 4.248 | 9.880 | 75.055 | 4.248 | 9.880 | 75.055 | 14.410 | 33.511 | 71.681 |
| 3 | 3.074 | 7.148 | 82.203 | 3.074 | 7.148 | 82.203 | 3.394 | 7.893 | 79.573 |
| 4 | 1.595 | 3.708 | 85.911 | 1.595 | 3.708 | 85.911 | 2.553 | 5.937 | 85.511 |
| 5 | 1.370 | 3.186 | 89.097 | 1.370 | 3.186 | 89.097 | 1.383 | 3.215 | 88.726 |
| 6 | 1.201 | 2.794 | 91.891 | 1.201 | 2.794 | 91.891 | 1.361 | 3.165 | 91.891 |

Table 4.1.20: Result of Total Variance Explained for year 2008

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 28.999 | 67.440 | 67.440 | 28.999 | 67.440 | 67.440 | 17.137 | 39.854 | 39.854 |
| 2 | 4.683 | 10.890 | 78.330 | 4.683 | 10.890 | 78.330 | 15.810 | 36.767 | 76.621 |
| 3 | 2.651 | 6.164 | 84.494 | 2.651 | 6.164 | 84.494 | 3.067 | 7.131 | 83.752 |
| 4 | 1.360 | 3.163 | 87.657 | 1.360 | 3.163 | 87.657 | 1.522 | 3.541 | 87.293 |
| 5 | 1.324 | 3.079 | 90.736 | 1.324 | 3.079 | 90.736 | 1.272 | 2.959 | 90.251 |
| 6 | 1.049 | 2.439 | 93.174 | 1.049 | 2.439 | 93.174 | 1.257 | 2.923 | 93.174 |

Table 4.1.21: Result of Total Variance Explained for year 2009

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 25.279 | 58.788 | 58.788 | 25.279 | 58.788 | 58.788 | 16.502 | 38.376 | 38.376 |
| 2 | 5.708 | 13.275 | 72.063 | 5.708 | 13.275 | 72.063 | 13.855 | 32.221 | 70.597 |
| 3 | 2.916 | 6.782 | 78.845 | 2.916 | 6.782 | 78.845 | 3.253 | 7.566 | 78.163 |
| 4 | 2.093 | 4.867 | 83.711 | 2.093 | 4.867 | 83.711 | 2.139 | 4.974 | 83.137 |
| 5 | 1.480 | 3.443 | 87.154 | 1.480 | 3.443 | 87.154 | 1.545 | 3.592 | 86.729 |
| 6 | 1.133 | 2.634 | 89.788 | 1.133 | 2.634 | 89.788 | 1.266 | 2.945 | 89.674 |
| 7 | 1.082 | 2.517 | 92.306 | 1.082 | 2.517 | 92.306 | 1.132 | 2.631 | 92.306 |

Table 4.1.22: Result of Total Variance Explained for year 2010

| Total Variance Explained | | | | | | | | | |
|---------------------------------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 25.627 | 59.598 | 59.598 | 25.627 | 59.598 | 59.598 | 18.194 | 42.312 | 42.312 |
| 2 | 6.281 | 14.607 | 74.205 | 6.281 | 14.607 | 74.205 | 12.730 | 29.605 | 71.917 |
| 3 | 2.884 | 6.707 | 80.912 | 2.884 | 6.707 | 80.912 | 3.422 | 7.959 | 79.876 |
| 4 | 2.051 | 4.770 | 85.683 | 2.051 | 4.770 | 85.683 | 1.923 | 4.471 | 84.347 |
| 5 | 1.440 | 3.349 | 89.032 | 1.440 | 3.349 | 89.032 | 1.610 | 3.743 | 88.090 |
| 6 | 1.074 | 2.498 | 91.530 | 1.074 | 2.498 | 91.530 | 1.479 | 3.440 | 91.530 |

4.2 Ordinary Least Square (OLS)

With the grouped factors obtained from the factor analysis, we run the regression using OLS to find out the relationship between the factors and stock price. Besides that, we can also ascertain the significance of the factors by looking at the probability obtained from the OLS results.

We have tried several methods in our research to get a better result. We first tried to run the factor analysis without controlling the number of companies in each year, and run OLS test for the factors that have been grouped.

Table 4.2.1: Results of OLS Obtained Without Adjustment on Number of Companies for Year 2000

| Factor | Coefficient | Probability |
|--------------------|-------------|-------------|
| Firm Size I | -0.008500 | 0.9123 |
| Firm Size II | -0.032182 | 0.6770 |
| Earnings I | 0.022313 | 0.7727 |
| Earnings II | -0.246298 | 0.0020 * |
| Cash Flow | -0.099769 | 0.9185 |
| Preference Capital | 0.018416 | 0.8115 |
| R-Squared | 0.128544 | |
| Prob (F-statistic) | 0.069258 | |
| Normality Test | 0.000000 | |

Table 4.2.2: Correlation Coefficient of Independent Variables and Dependent Variables Without Adjustment on Number of Companies for Year 2000

| | Firm Size I | Firm Size II | Earnings I | Earnings II | Cash Flow | Preference Capital |
|-----------------------|----------------|-----------------|------------|----------------|--------------|-----------------------|
| Firm Size I | 1 | | | | | |
| Firm Size II | 4.96E-13 | 1 | | | | |
| Earnings I | -3.44E-11 | 5.72E-11 | 1 | | | |
| Earnings II | -3.29E-11 | 4.92E-12 | -1.49E-11 | 1 | | |
| Cash Flow | -1.67E-09 | -1.69E-09 | 2.18E-10 | 6.03E-09 | 1 | |
| Preference Capital | -3.46E-11 | 5.84E-11 | -1.66E-11 | 2.68E-11 | -4.97E-10 | 1 |

From the results obtained above, we found that there is only one significant variable in the model, which is Earnings II. Though there are no multicollinearity problems in the model, the normality test of the model is not significant. Thus, we adjust the number of companies for every year to become the same numbers. Our findings are shown below.

Table 4.2.3: Ordinary Least Square Method's Findings for Firm Size I

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2000 | 0.032486 | 0.6469 | 0.168454 | 0.079246 |
| 2001 | -0.028726 | 0.6656 | 0.136679 | 0.254511 |
| 2002 | -0.035313 | 0.7639 | 0.018737 | 0.985538 |
| 2003 | -0.039766 | 0.2671 | 0.076708 | 0.646009 |
| 2004 | -0.054423 | 0.3483 | 0.063101 | 0.750321 |
| 2005 | 0.011461 | 0.7788 | 0.175758 | 0.066326 |
| 2006 | -0.024160 | 0.7791 | 0.047199 | 0.924352 |
| 2007 | 0.016441 | 0.6558 | 0.120992 | 0.336960 |
| 2008 | -0.037282 | 0.4953 | 0.050326 | 0.841298 |
| 2009 | 0.016340 | 0.5654 | 0.155189 | 0.264218 |
| 2010 | -0.089564 | 0.0845 * | 0.082861 | 0.598575 |

Note: * Statistically significant at 0.1 level

Table 4.2.4: Ordinary Least Square Method's Findings for Firm Size II

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2000 | 0.016155 | 0.8197 | 0.168454 | 0.079246 |
| 2001 | -0.035531 | 0.5931 | 0.136679 | 0.254511 |
| 2002 | -0.050289 | 0.6689 | 0.018737 | 0.985538 |
| 2003 | -0.037443 | 0.2958 | 0.076708 | 0.646009 |
| 2004 | 0.013826 | 0.8109 | 0.063101 | 0.750321 |
| 2005 | -0.110954 | 0.0085 * | 0.175758 | 0.066326 |
| 2006 | -0.096076 | 0.2674 | 0.047199 | 0.924352 |
| 2007 | -0.023281 | 0.5283 | 0.120992 | 0.336960 |
| 2008 | -0.014893 | 0.7849 | 0.050326 | 0.841298 |
| 2009 | -0.029961 | 0.2937 | 0.155189 | 0.264218 |
| 2010 | -0.037727 | 0.4617 | 0.082861 | 0.598575 |

Note: * Statistically significant at 0.1 level

H₀: There is no significant relationship between firm size and stock return.

H₁: There is significant relationship between firm size and stock return.

From the results of Firm Size I and Firm Size II obtained from the OLS, we found that there are negative relationship between firm size and stock return for most of the years except year 2000. The results are supported by the findings of Chui and Wei (1998), Dhatt et al (1999), Lau, Lee and McInish (2002), Bollen et al (2008), and Senthilkumar (2009). The reasons are due to the higher risk absorbed by small firms. Smaller firms are weaker in receiving news, thus they are unable to diversified most of their risk. Based on the risk-return trade off theory, the higher risk one take on, the higher return he required. However, the positive relationship obtained from year 2000 is consistent with the findings of Chui and Wei (1998), and Lam and Spyrou (2003), as the large firm is creating more profits than small firms. The p-value for the year 2010 for firm size I and 2005 for firm size II are significant, which is smaller than 0.1 significant level.

Table 4.2.5: Ordinary Least Square Method's Findings for Earnings I

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2000 | -0.183502 | 0.0120 * | 0.168454 | 0.079246 |
| 2001 | -0.155881 | 0.0222 * | 0.136679 | 0.254511 |
| 2002 | -0.009726 | 0.9340 | 0.018737 | 0.985538 |
| 2003 | -0.030723 | 0.3901 | 0.076708 | 0.646009 |
| 2004 | -0.055429 | 0.3395 | 0.063101 | 0.750321 |
| 2005 | -0.012152 | 0.7658 | 0.175758 | 0.066326 |
| 2006 | -0.036845 | 0.6689 | 0.047199 | 0.924352 |
| 2007 | 0.023010 | 0.5331 | 0.120992 | 0.336960 |
| 2008 | 0.053106 | 0.3325 | 0.050326 | 0.841298 |
| 2009 | 0.007419 | 0.7938 | 0.155189 | 0.264218 |
| 2010 | -0.008492 | 0.8681 | 0.082861 | 0.598575 |

Note: * Statistically significant at 0.1 level

Table 4.2.6: Ordinary Least Square Method's Findings for Earnings II

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2008 | -0.014040 | 0.7969 | 0.050326 | 0.841298 |
| 2009 | -0.043775 | 0.1274 | 0.155189 | 0.264218 |
| 2010 | 0.001050 | 0.9836 | 0.082861 | 0.598575 |

Note: * Statistically significant at 0.1 level

H₀: There is no significant relationship between firm size and stock return.

H₁: There is significant relationship between firm size and stock return.

The p-value for year 2000 and 2001 for earning I are significant. Apart from the results for year 2007, the results for the other years show a negative relationship against stock return. This is because some firms apply the method of earning smoothing. By controlling their earning value, the data quality has been deteriorated. Thus affect the relationship in long term. Our results are consistent with the findings of Roodposhti and Valipoor (2010). There are a few studies that supported the results for year 2007, such as Haugen & Baker (1996), and Kothari et al (2003), which explained that the stock return will increase when the earning of firms increases.

Table 4.2.7: Ordinary Least Square Method’s Findings for Preference Capital

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2000 | 0.045229 | 0.5241 | 0.168454 | 0.079246 |
| 2002 | -0.055183 | 0.6390 | 0.018737 | 0.985538 |
| 2003 | -0.005092 | 0.8863 | 0.076708 | 0.646009 |
| 2004 | -0.028655 | 0.6203 | 0.063101 | 0.750321 |
| 2005 | 0.052620 | 0.2006 | 0.175758 | 0.066326 |
| 2006 | -0.023888 | 0.7815 | 0.047199 | 0.924352 |
| 2007 | -0.065942 | 0.0780 * | 0.120992 | 0.336960 |
| 2008 | -0.057247 | 0.2965 | 0.050326 | 0.841298 |
| 2009 | -0.046466 | 0.1061 | 0.155189 | 0.264218 |
| 2010 | 0.047798 | 0.3518 | 0.082861 | 0.598575 |

Note: * Statistically significant at 0.1 level

H₀: There is no significant relationship between preference capital and stock return.

H₁: There is significant relationship between preference capital and stock return.

The p-value for year 2007 is significant, which it is smaller than 0.1 significant level. Preference capital also can be called preference share which is one of type of the share that issue from a company to raise fund. The coefficients of preference capital on year 2000, 2005, and 2010 have shown the positive relationship to stock return. Preference capital possesses few benefits as the investors have a prior advantage to claim for dividend before ordinary shareholders. However, for year 2001, 2002, 2003, 2004, 2006, 2007, 2008 and 2009, the results shows a negative relationship. This is because companies receive lesser preference capital, and thus do not have the need to pay for dividend. Companies can have more capital to expand the company, and thus, increases the stock value.

Table 4.2.8: Ordinary Least Square Method’s Findings for Market-to-Book Equity

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2000 | -0.123878 | 0.0848 * | 0.168454 | 0.079246 |
| 2001 | 0.027925 | 0.6744 | 0.136679 | 0.254511 |
| 2002 | -0.042355 | 0.7187 | 0.018737 | 0.985538 |
| 2003 | 0.009510 | 0.7895 | 0.076708 | 0.646009 |
| 2004 | -0.032962 | 0.5689 | 0.063101 | 0.750321 |
| 2005 | -0.053959 | 0.1896 | 0.175758 | 0.066326 |
| 2006 | -0.065088 | 0.4509 | 0.047199 | 0.924352 |
| 2007 | 0.059783 | 0.1092 | 0.120992 | 0.336960 |
| 2008 | -0.007488 | 0.8908 | 0.050326 | 0.841298 |

Note: * Statistically significant at 0.1 level

H₀: There is no significant relationship between market-to-book and stock return.

H₁: There is significant relationship between market-to-book and stock return.

The p-value of the year 2000 is significant since it is smaller than 0.1 significant level. Besides the positive results for year 2001, 2003, and 2007, the results show negative relationship. The findings are supported by the research of Sttatman (1980), Rosenberg, Reid and Lanstein (1985), De Bondt & Thaler (1987), Chan et al (1991) and Chan & Chui (1996). This is because the higher value of company as compared to par, means that the company is well developed, thus attracted more investors to invest in their company. The reasons for the positive relationship can also be explained as aggressive investors are investing in low rating companies. To assume the risk, the investors asked for a higher return. Once the company is able to the project they investing in, they will gain a high profits.

Table 4.2.9: Ordinary Least Square Method's Findings for Extraordinary Items

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2001 | 0.071041 | 0.2874 | 0.136679 | 0.254511 |
| 2004 | 0.056744 | 0.3283 | 0.063101 | 0.750321 |
| 2006 | -0.026475 | 0.7585 | 0.047199 | 0.924352 |
| 2009 | 0.042453 | 0.1390 | 0.155189 | 0.264218 |

Note: * Statistically significant at 0.1 level

H₀: There is no significant relationship between extraordinary items and stock return.

H₁: There is significant relationship between extraordinary items and stock return.

None of the p-value of extraordinary items is significant. The results show that there are positive relationship between extraordinary items and stock return in year 2001, 2004, and 2009. This is because there are some unexpected events happen during the years, which are 911 attacks, Tsunami, and H1N1. These events benefited some sectors such as the medication sectors. However, the negative relationship shown in year 2006 is due to the unexpected losses occurred in a company which are unusual.

Table 4.2.10: Ordinary Least Square Method's Findings for Cash Flow

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2001 | -0.055123 | 0.4080 | 0.136679 | 0.254511 |
| 2002 | -0.067855 | 0.5643 | 0.018737 | 0.985538 |

Note: * Statistically significant at 0.1 level

Table 4.2.11: Ordinary Least Square Method's Findings for Current Assets

| Year | Coefficient | Probability | R-squared | Prob (F-statistic) |
|------|-------------|-------------|-----------|--------------------|
| 2003 | -0.035770 | 0.3176 | 0.076708 | 0.646009 |
| 2006 | -0.038639 | 0.6539 | 0.047199 | 0.924352 |
| 2007 | -0.013193 | 0.7205 | 0.120992 | 0.336960 |
| 2009 | 0.015005 | 0.5975 | 0.155189 | 0.264218 |
| 2010 | 0.011351 | 0.8243 | 0.082861 | 0.598575 |

Note: * Statistically significant at 0.1 level

H₀: There is no significant relationship between cash flow (current assets) and stock return.

H₁: There is significant relationship between cash flow (current assets) and stock return.

None of the p-value is significant. We are combining both cash flow and current assets in the interpretation as the variables are categorized under liquidity. The results for year 2001, 2002 for cash flow, and 2003, 2006 and 2007 for current assets shows a negative relationship against stock returns. The results are supported by the research of Datar, Naik & Radcliffe (1998), Amihud (2002), Omri, Zayani and Loukil (2010), Chang et al (2009) and Huang (2009). The reason behind is because the more liquid the company, the less risk it face. Thus, investors are more secured, and will not ask for more risk premium, thus the required return is lower. However, the results of year

2009 and 2010 shows a positive relationship, and is supported by Jun, Marathe and Shawky (2002), Bollen et al (2008), and Hirshleifer et al (2009). This can be explained as investors have more confidence on company that is highly liquid, as there is lesser possibility of default payment. When the company receive more capital from investors, they have the chance to expand their business, and making more profits, thus, stock return increases.

Based on the prior knowledge, the independent variables should have a significant effect on stock returns. However, due to the issues of data non-normally distributed, our results are affected. Solving of the issue is beyond our scope of study. We refer the readers to the recommendations section for our further recommendations for future research.

4.3 Diagnostic Checking

4.3.1 Correlation Coefficient Test

Table 4.3.1.1: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2000

| | Firm Size I | Firm Size II | Earning | Market-to- Book | Preference Capital |
|--------------------|----------------|-----------------|-----------|--------------------|-----------------------|
| Firm Size I | 1 | | | | |
| Firm Size II | 6.15E-11 | 1 | | | |
| Earning | 4.28E-11 | 2.67E-11 | 1 | | |
| Market-to-Book | -6.56E-11 | -4.01E-11 | 1.01E-10 | 1 | |
| Preference Capital | 3.59E-12 | -2.49E-11 | -2.83E-11 | -4.31E-11 | 1 |

Table 4.3.1.2: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2001

| | Cash Flow | Earnings | Extraordinary | Firm Size I | Firm Size II | Market-to-Book |
|----------------|-----------|-----------|---------------|-------------|--------------|----------------|
| Cash Flow | 1 | | | | | |
| Earnings | -1.46E-11 | 1 | | | | |
| Extraordinary | 4.74E-11 | -6.44E-11 | 1 | | | |
| Firm Size I | 1.15E-11 | -1.00E-10 | 6.48E-12 | 1 | | |
| Firm Size II | -6.64E-11 | -4.82E-11 | -9.10E-11 | -4.38E-11 | 1 | |
| Market-to-Book | 1.71E-11 | 8.80E-11 | -3.17E-11 | -5.06E-12 | -3.77E-11 | 1 |

Table 4.3.1.3: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2002

| | Cash Flow | Earnings | Firm Size I | Firm Size II | Market-to- Book | Preference Capital |
|-----------------------|-----------|-----------|----------------|-----------------|--------------------|-----------------------|
| Cash Flow | 1 | | | | | |
| Earnings | -8.58E-10 | 1 | | | | |
| Firm Size I | 3.59E-11 | -2.81E-10 | 1 | | | |
| Firm Size II | 9.13E-11 | -8.79E-10 | 4.89E-11 | 1 | | |
| Market-to-Book | -7.40E-11 | -6.09E-10 | 2.21E-11 | 2.45E-11 | 1 | |
| Preference Capital | -4.67E-11 | 1.78E-09 | -1.34E-11 | 2.91E-12 | 5.83E-11 | 1 |

Table 4.3.1.4: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2003

| | Current Assets | Earnings | Firm Size I | Firm Size II | Market-to-Book | Preference Capital |
|--------------------|----------------|-----------|-------------|--------------|----------------|--------------------|
| Current Assets | 1 | | | | | |
| Earnings | 1.62E-10 | 1 | | | | |
| Firm Size I | 3.20E-11 | -4.17E-11 | 1 | | | |
| Firm Size II | -1.17E-11 | -3.23E-11 | -5.50E-11 | 1 | | |
| Market-to-Book | -4.34E-11 | 2.08E-12 | 9.95E-12 | 7.33E-11 | 1 | |
| Preference Capital | -5.22E-11 | 6.92E-11 | 7.59E-11 | 1.58E-11 | 1.67E-11 | 1 |

Table 4.3.1.5: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2004

| | Earning | Extraordinary | Firm Size I | Firm Size II | Market-to-Book | Preference Capital |
|--------------------|-----------|---------------|-------------|--------------|----------------|--------------------|
| Earnings | 1 | | | | | |
| Extraordinary | 3.38E-11 | 1 | | | | |
| Firm Size I | 8.70E-11 | 3.95E-12 | 1 | | | |
| Firm Size II | -1.66E-11 | -4.26E-11 | -3.82E-11 | 1 | | |
| Market-to-Book | 5.48E-11 | -2.15E-11 | 4.65E-11 | -6.40E-11 | 1 | |
| Preference Capital | -3.33E-13 | -2.67E-11 | 2.79E-11 | 4.78E-11 | -7.30E-11 | 1 |

Table 4.3.1.6: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2005

| | Earnings | Firm Size I | Firm Size II | Market-to-Book | Preference Capital |
|--------------------|-----------|-------------|--------------|----------------|--------------------|
| Earnings | 1 | | | | |
| Firm Size I | -7.95E-11 | 1 | | | |
| Firm Size II | -2.84E-11 | 6.96E-11 | 1 | | |
| Market-to-Book | -9.87E-11 | 6.79E-11 | -4.24E-11 | 1 | |
| Preference Capital | -2.47E-11 | 1.01E-10 | 6.91E-13 | 7.50E-11 | 1 |

Table 4.3.1.7: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2006

| | Current Assets | Earning | Extraordinary | Firm Size I | Firm Size II | Market-to-Book | Preference Capital |
|--------------------|----------------|-----------|---------------|-------------|--------------|----------------|--------------------|
| Current Assets | 1 | | | | | | |
| Earning | 4.45E-11 | 1 | | | | | |
| Extraordinary | 1.74E-11 | 8.29E-11 | 1 | | | | |
| Firm Size I | 6.73E-11 | -5.12E-11 | 4.72E-11 | 1 | | | |
| Firm Size II | -5.67E-11 | -8.75E-11 | -4.64E-11 | -4.07E-11 | 1 | | |
| Market-to-Book | 1.89E-11 | 8.64E-12 | -2.96E-11 | -7.72E-11 | 4.40E-11 | 1 | |
| Preference Capital | 2.84-11 | 2.24E-11 | 4.19E-11 | 7.70E-11 | 2.07-11 | 4.98E-11 | 1 |

Table 4.3.1.8: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2007

| | Current Assets | Earnings | Firm Size I | Firm Size II | Market-to-Book | Preference Capital |
|--------------------|----------------|-----------|-------------|--------------|----------------|--------------------|
| Current Assets | 1 | | | | | |
| Earnings | -2.90E-12 | 1 | | | | |
| Firm Size I | -6.58E-11 | 5.74E-11 | 1 | | | |
| Firm Size II | -2.74E-11 | -1.27E-10 | -1.90E-11 | 1 | | |
| Market-to-Book | -2.26E-13 | -6.29E-11 | -1.46E-11 | -7.02E-11 | 1 | |
| Preference Capital | -7.37E-11 | -6.23E-11 | 5.49E-12 | -1.93E-11 | -4.82E-11 | 1 |

Table 4.3.1.9: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2008

| | Earning I | Earning II | Firm Size I | Firm Size II | Market-to-Book | Preference Capital |
|--------------------|-----------|------------|-------------|--------------|----------------|--------------------|
| Earning I | 1 | | | | | |
| Earning II | -6.43E-11 | 1 | | | | |
| Firm Size I | 4.77E-11 | -9.32E-11 | 1 | | | |
| Firm Size II | 1.22E-11 | 9.71E-11 | 5.76E-11 | 1 | | |
| Market-to-Book | -3.74E-11 | -5.45E-11 | -5.07E-11 | 4.67E-11 | 1 | |
| Preference Capital | 5.08E-11 | 2.94E-11 | -1.57E-11 | -1.34E-11 | 3.52E-11 | 1 |

Table 4.3.1.10: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2009

| | Current Assets | Earnings I | Earnings II | Extraordinary | Firm Size I | Firm Size II | Preference Capital |
|--------------------|----------------|------------|-------------|---------------|-------------|--------------|--------------------|
| Current Assets | 1 | | | | | | |
| Earnings I | -6.44E-11 | 1 | | | | | |
| Earnings II | -1.04E-13 | -6.88E-11 | 1 | | | | |
| Extraordinary | 2.08E-11 | 5.83E-11 | 1.34E-11 | 1 | | | |
| Firm Size I | -2.97E-11 | 7.56E-11 | 5.21E-11 | 3.49E-11 | 1 | | |
| Firm Size II | -3.07E-09 | 1.81E-08 | 5.87E-09 | -2.88E-09 | 6.09E-09 | 1 | |
| Preference Capital | 4.64E-12 | -1.87E-11 | 8.79E-11 | -6.24E-11 | -2.61E-11 | -1.43E-09 | 1 |

Table 4.3.1.11: Correlation Coefficient of Independent Variables and Dependent Variables for Year 2010

| | Current Assets | Earnings I | Earnings II | Firm Size I | Firm Size II | Preference Capital |
|--------------------|----------------|------------|-------------|-------------|--------------|--------------------|
| Current Assets | 1 | | | | | |
| Earnings I | -4.98E-11 | 1 | | | | |
| Earnings II | 7.93-12 | -5.47E-11 | 1 | | | |
| Firm Size I | -0.001390 | -0.002717 | 0.001317 | 1 | | |
| Firm Size II | -4.68-11 | 2.76E-11 | 1.28E-10 | -0.000540 | 1 | |
| Preference Capital | -7.15E-11 | -2.71E-11 | -2.02E-11 | 0.000234 | -4.46E-11 | 1 |

From the results of correlation shown above, there are no highly correlated paired variables in each of the year, which means that all the correlations between variables are smaller than 0.8. The results have proven that factor analysis method have solved multicollinearity problems in our model by grouping the similar components under a same factor, which eliminated the multicollinearity problems.

4.3.2 Normality Test

Table 4.3.2.1: Jarque-Bera Normality Test Results for Year 2000 to Year 2010

| Year | Probability |
|------|-------------|
| 2000 | 0.000006 |
| 2001 | 0.000000 |
| 2002 | 0.000000 |
| 2003 | 0.118018 |
| 2004 | 0.000000 |
| 2005 | 0.004535 |
| 2006 | 0.000000 |
| 2007 | 0.000000 |
| 2008 | 0.000000 |
| 2009 | 0.536954 |
| 2010 | 0.000000 |

According to the Jarque-Bera test, we found that apart from year 2003 and 2009, our models for another nine years are not significant. The reason behind is because of the missing values of some companies data, which have been cleared from our research.

4.4 Conclusion

In conclusion, the results had achieved the objective of the research. This chapter also helped to understand better on the affect of each factors on stock return. The summary of the research and the major findings will be concluded in the next chapter. Besides that, the implications of the study and limitations will also be discussed. Lastly, recommendations for future researchers will be suggested in the next chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

In this chapter, we summarized and concluded those research objectives and questions that laid out in chapter 1. The main objective of our study is to determine whether fundamental factors can explain the cross-sectional variation of stock returns. Furthermore, we included managerial implications that provide practical implications for policy makers and practitioners in this chapter and discussed our major findings that listed in chapter 4 with those points of view from previous researchers. Moreover, several limitations that we encountered during the progress of the research were presented in this chapter as well as the recommendations for future researchers. Lastly, the overall conclusion for the whole research was stated as ending for this project.

5.1 Inferential Analyses

5.1.1 Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis is a tool of statistical data reduction and analysis. It normally applied in identification of underlying factors. We applied this statistical method during the data processing process in order to reduce duplication from a relatively large set of correlated variables. This method assisted us to describe the correlations among numerous independent variables and thereafter grouped it into several new factors. We then build a regression

model with this new set of factors and this enable our research to be free from any serious multicollinearity problem. This allows us to explain many variables by using few factors. By this way, the explanatory power of the model can be enhanced. The main advantages of EFA are grouping various variables with similar characteristics into a single factor and understand how they are correlated to each other through the provided statistical table.

5.1.2 Ordinary Least Squares (OLS)

Our study utilized the Ordinary Least Squares (OLS) techniques to study the relationship between the various independent variables such as firm size, book-to-market equity, earning yields, cash flow and leverage ratio with our dependent variable which was stock price movement. OLS technique is used to calculate the value of estimators. Each estimator allows us to measures the changes in the mean value of dependent variable per unit changes in each independent variable.

OLS method is sufficed for point estimator and OLS estimators are expressed solely in observable quantities, thus it can be easily calculated. The underlying principle of OLS method is finding the values of estimator that produce the smallest sum of squared errors. OLS method possesses various statistical properties if the seven assumptions of well-known Gauss-Markov Theorem are hold in the same time. Under this situation, an OLS estimator is said to be a best linear unbiased estimator (BLUE).

5.2 Discussions of Major Findings

Table 5.2.1: Summary of Major Findings

| Independent Variables | Relationships with Dependent Variables | Years |
|------------------------------|-----------------------------------------------|--------------------------------------------------------|
| Firm Size I | Positive | 2000, 2005, 2007 & 2009 |
| | Negative | 2001, 2002, 2003, 2004, 2006, 2008 & 2010* |
| Firm Size II | Positive | 2000, 2004, |
| | Negative | 2001, 2002, 2003, 2005*, 2006, 2007, 2008, 2009 & 2010 |
| Earning I | Positive | 2007, 2008 & 2009 |
| | Negative | 2000*, 2001*, 2002, 2003, 2004, 2005, 2006 & 2010 |
| Earning II | Positive | 2010 |
| | Negative | 2008 & 2009 |
| Preference Capital | Positive | 2000, 2005 & 2010 |
| | Negative | 2002, 2003, 2004, 2006, 2007*, 2008, 2009 |
| Market-to-Book Equity | Positive | 2001 & 2003 |
| | Negative | 2000*, 2002, 2004, 2005, 2006, 2007 & 2008 |
| Extraordinary Items | Positive | 2001, 2004 & 2009 |
| | Negative | 2006 |
| Cash Flow | Positive | - |
| | Negative | 2001 & 2002 |
| Current Assets | Positive | 2009 & 2010 |
| | Negative | 2003, 2006 & 2007 |

Note:* Statistically significant at 0.1 level

Stock return is revenue that earned from the stock investment and act as a compensation for taking the risk of investment in specific stock. Based on the risk-return tradeoff, share with high stock return normally associated with high risk. Hence, it is crucial to understand the factors that influence the stock returns. This study examine the relationship between stock returns and fundamental factors (firm size, book-to-market equity, earning, preference capital, extraordinary, cash flow and current assets). As ground the analysis of data, the research objectives seem have been answered and achieved. The summary results of hypotheses testing are shown below.

5.2.1 Stock Return and Firm Size

Hypothesis 1: There is a significant relationship between stock return and firm sizes

The significant values (p-value) of firm size against stock return in the year 2005 (Firm size II) and 2010 (Firm Size I) were 0.0085 and 0.0845 (< 0.10) and this indicated that there was a statistically significant negative relationship between these two variables. According to the Banz (1981), firm size had a strong negative relationship with average stock returns. Size effect is significant in the smallest firms since it is consisting of insufficient intelligence about the assets and induces higher risk to the dealers consequently. Therefore, risky stock is normally compensated by high return.

However, our statistical result of other years revealed that there was insufficient evidence to determine such a significant relationship. According to statistical tables of Firm Size I (year 2000, 2005, 2007 and 2009) and Firm Size II (year 2000 and 2004), firm size has explained stock return in a positive way. This result was consistent with the previous studies (Lam & Spyrou, 2003). This size effect proved that larger firm is creating more profit than

smaller firm. In large company, management team normally has more retained earnings to invest and enhance their business performance. By this way, value of stock can be boost up and investors could obtain high return by selling it at a favourable condition.

In some other years (Firm size I table - year 2001, 2002, 2003, 2004, 2006 and 2008 and Firm Size II table - year 2001, 2002, 2003, 2006, 2007, 2008, 2009 and 2010), the negative relationship between stock return and firm size has been proved. (Roselee & Hon, 2009) verified such a negative relationship by combining firm size with other economic term and examined the different firm size effects against the stock market. In previous research by Bollen et al (2008), firm capitalization especially small firm has a negative effect on the expected return. Compare to large firm, small firms are normally growth-oriented. Small firm director will pursuing the strategy of corporate wealth maximization instead of shareholder wealth maximization. This growth orientation will increase the stock value as it focus on growth in earnings and dividends as much as possible over the long run. Thus, stock return will be higher as investor can sell it at higher price.

5.2.2 Stock Return and Earnings

Hypothesis 2: There is a significant relationship between stock return and earnings

In the year 2000 and 2001, significant values (p-value) of earning I table were showed as 0.0120 and 0.0222 (< 0.10). Both of them indicated that there was a statistically relationship between stock return and earning. Earning factor has explaining stock return in a positive way in the several years (Earning I table - year 2007, 2008 and 2009; Earning II table - year 2010). These findings are similar to previous studies by Haugen and Baker (1996). The higher the

earnings, the higher the expected stock return. It was supported by Huang (2004), who proved that earning showed a positive relationship with stock return of portfolio. With the available of high earning, the resources of firm can be enhanced and thus promote high performance and share value. This indirectly provides high return for investors.

In contrast, Earning I table (year 2002, 2003, 2004, 2005, 2006 and 2010) and Earning II table (year 2008 and 2009) has revealed the negative relationship between earnings and stock return. This is because some firms apply the method of earning smoothing. By controlling their earning value, the data quality has been deteriorated. Thus affect the relationship in long term. Our results are consistent with the finding of Roodposhti and Valipoor (2010),

5.2.3 Stock Return and Market-to-Book Equity

Hypothesis 3: There is a significant relationship between stock return and market-to-book equity

The significant value (p-value) of market-to-book equity in the year 2000 showed as 0.0848, which was lesser than the significance level of 0.10. This proved that there was a significant relationship between stock return and market-to-book equity. Nevertheless, our statistical table had revealed a positive relationship between market-to-book equity and stock return in the year 2001, 2003 and 2007. If the company value is lower than its par value, some investor may take aggressive and risky investment on it. Thus, share price of the company will be increased and high stock return will be provided.

Fama and French (1992) found that book to market equity has a good explanatory power for stock returns as it able to explain the cross-sectional variation in average stock returns better than other factors especially CAPM market beta (β).

Other than this, market-to-book equity has showed a negative relationship with stock return in the years 2001, 2003 and 2007. These results are consistent to the previous studies conducted by Statman (1980), Rosenberg, Reid and Lanstein (1985) and Chan et al (1991). Chan et al (1991) who conducted research in the Japanese stock market with Seemingly Unrelated Regression (SUR) model also revealed that book-to-market has a reliably positive impact on expected returns. As the company value increase more than its par value of its share, many investors will become more confidence to invest in the share of that particular company as it has a sound financial structure. With the available of share capital, company can develop their company and thus provide high stock return.

5.2.4 Stock Return and Cash Flow (Current Asset)

Hypothesis 4: There is a significant relationship between stock return and cash flow (Current Asset)

According to the statistical results, cash flow's significant values (p-value) of the year 2001 and 2002 were bigger than significance level of 0.10, there was no enough evidence to prove that cash flow factor has strong explanatory power on stock return.

Based on the previous studies, Amihud (2002) found out stock return was negatively affected by liquidity. Since company with highly liquid assets such as cash on hand normally faces less liquidity risk, its shareholders will demand for less risk premium. Thus, share of that particular company will resulting in low stock return. According to Huang (2009), historical cash flow volatility had a strong and consistent negative with ex-post stock return. Cash flow volatility is a proxy of return volatility and systematic and idiosyncratic return volatility have negative relationship with return (Ang et al, 2006).

In a nutshell, all the individual variables according to a prior knowledge should have a significant impact on stock returns. However, here possibly due to certain data issues such as non-normal distribution and this has affected our results. Solving some of these data issues is beyond the scope of this study. We refer the reader to the recommendations section for our further recommendations for future research.

5.3 Implications of the Study

Majority of the previous researchers have applied time series statistical approach in their study of stock return performance. Nevertheless, our study had emphasized on cross-sectional relationship between stock return and fundamental factors. This provides additional knowledge to the public and helps them to better understanding about stock market from different approach. Throughout our study, public may able to know which fundamental factors has more exploratory power on the performance of stocks. In addition, our statistical results have revealed several important managerial implications to people that come from different sector of economy.

5.3.1 For the Managerial

Company's management team who are charged with the responsibility of managing day-to-day operations could use this study to enhance the company's performance. They are able to set a clear direction and establish future goals for all employees based on those factors that proved significant in this study. Thus, operations of the business are enhanced and company remains competitive in today fast changing world. For instance, managing director of ABC Company pay more effort on book to market equity ratio as it

has been proved to be the primary factor in explaining average stock return.

5.3.2 For the Fund Manager

Fund manager are able to decide what factor to focus when they are charged with responsibility of choosing stocks. They are able to make wise investment decision and allocate a reasonable amount of fund on different stock, provided information of relationship between stock return movement and fundamental factors are available. For example, firm size is significantly affecting the movement of stock. Prior to make any investment decision, Pension Fund managers should focus on the sizes of the different company and attempt to invest in a right stock at the right time. The successfulness of pension fund manager in choosing right stock can helps to maximize the wealth of shareholder. Thereafter, more people are having confidence on them and willing to submit their fund for investment and thus economy of the country and standard of living can be enhanced.

5.3.3 For the Speculator

Besides, individual investor who acts as a speculator can enjoy benefits that provided by this study as well. Speculators normally focus on one market to speculate and gain their profit by buying one specific unit of share at lower price and selling it back at higher price if market condition proves favourable. One should always have some specific knowledge on stock market if they want to speculate on it. Stock market is carrying high risk than bond market, speculator should always consider the significant relationship between fundamental factors and stock return in the moment of choosing stock. It may quite useful for speculator to infer their investment decision from this study

whose reveal information for such a relationship. If a company shows a bad sign on significant fundamental factors, speculator should not speculate on shares of that particular company.

5.3.4 For the Hedger

This study also plays a predominant role in the hedging world. Hedging is a process which normally carried out by the risk-averse investors which attempt to reduce the adverse price movement in the stock market. This study provides some fact to investor in deciding whether there is a necessary to carry out hedging process on their current investment. From our study, some significant relationship between expected stock return and fundamental factors was proved. For a better decision, investors should link that particular factor with any company and make comparison on it. If company is well-performed with stated significant factor, investor can save their hedging cost and speculate on it.

5.3.5 For the Regulators

Moreover, this study is quite useful for different regulators to set better rules or revise their existing regulations. In view of the fact that several factors have strong relationship with its average stock return, stock exchange authority can emphasized on those factors such as cash flow factor while revising their current rules and regulations. For example, prior requirement of company listing to stock exchange could be revised by stating the minimum amount of cash that company must hold on hand before the company making an application of listing. By referring to this study, liquidity regulators could inspect and evaluate the trouble company condition from those significant

factors before formally declared its status to bankruptcy. With the availability of revised rules and regulations, economy of the country can be improved and thus boost up.

5.4 Limitations of the Study

During the period of research, there are some limitations that become apparent in this study. It is important for all limitation to be recognized and learnt as this enable future researcher to take more consideration on those areas and become more knowledgeable in this study.

The first limitation is the difficulties in searching relevant journal articles. Most of the time, journal articles is not free of charge for us to review and majority of the previous researchers around the world have carried out their relevant research with time series approach instead of cross-sectional approach, therefore it is time consuming and challenging to search journal articles that appropriate to this study and there is short of information to support the analysis process.

The second limitation is lack of technology resources in gathering S&P 500 Company's dataset. This dataset is large and the only way we can gather is through our university's subscribed data stream. However, it has been insufficiencies of computer that available to us for downloading and gathering the dataset. It is time consuming and inconvenience for us to accomplish our data gathering process within our schedule plan.

The third limitation is incompleteness of S&P 500 Company's dataset. A number of company's dataset was unable to be searching and downloading from data stream such as 3M Co. Moreover, there are some missing values in company's dataset which might be due to control of disclosure standard practice. All these deficiencies had

caused inconsistency of data and confined us from conducting a comprehensive research.

The fourth limitation is the problem of standard error. According to the e-view results that showed in the chapter to 4, we obtained the same result for standard error for each year for all the independent variable. The reason might be there is only a relatively small amount change in standard error and it cannot be fully showed in the e-view table due to limitation of decimal places.

The limitations are acknowledged but they do not detract from the significance of findings but merely provide platforms for future research.

5.5 Recommendations for future research

There are some recommendations for future researchers. First and foremost, we recommend future researchers apply another methodology-nonparametric test to conduct similar study. This is due to nonparametric test is another classification of statistical method and it might be provide people with different point of view. The instances of nonparametric test are Wilcoxon -rank sum test and Kruskal-Wallis test.

Both tests are normally utilized in comparison of means between different groups. Unlike parametric test, nonparametric test do rely on less assumption. The most common feature of nonparametric test is that it can be utilized even the data is not approximately normally distributed or severely skewed. This test also does not take into consideration of mean and standard deviation of parameters and it could be apply when there is a small sample size (less than 30 samples) (Hoskin, n.d.).

In order to attain more reliable results, future researchers are encouraged to include more new factor into their model and compare its statistical results with other previous studies. This is due to average stock return represent a fair value of

underlying company and it can be influenced by any other new factors in today fast changing world. There is also a possibility that previous relationship between one fundamental factor and stock return will change from insignificant to significant relationship with the introduction of new factor. Other than this, future researchers could focus on non-financial characteristics of company as well instead of only treat financial characteristics as factors to explain stock return. It is important for future researchers to emphasize and find out in the future.

Since majority of the previous researchers have focus their stock return research with time series data, there is a strong need for future researchers to carry out more research based on cross-sectional data. By doing this, more people are able to get real and clear picture about stock market better as cross-sectional method only take into consideration of one year data and it is useful to find explanatory variable. This cross-sectional research also could make some contribution to the academic side by serving as a guideline for students who are doing their thesis.

Furthermore, future researchers are advised to download complete set of S&P 500 Companies data from other available data sources in order to increase the accuracy and consistency of the research. Normality test of error term also is another issue that future researchers should concern. They should find out the reasons that influence the normal distribution of error term in order to increase the reliability of their research.

5.6 Conclusion

The main objective of this study is to determine whether stock returns can be explained by fundamental factors. This study was conducted with the 12 years S&P Company's yearly financial data and stock price data. Two different methodologies were applied in the whole research. Factor analysis statistical method was applied in processing and grouping of data with similar characteristics into new factors and e-view statistical method was utilized to analysis the relationship between stock returns and fundamental factors.

As the conclusion, our research objectives had been reasonably achieved as we managed to examine the relationship between those fundamental factors and stock return. We are unable to conclude on the issue of whether accept or reject all hypotheses due to certain data issues like non-normal distribution. The issue has affected our results and solving some of these data issues is beyond our scope of this study. Therefore, we suggest the reader to the recommendations section for our further recommendations for future research.

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APPENDIX

Table 4.1.1: Rotated Component Matrix for Year 2000

Rotated Component Matrix^a

| | Component | | | | |
|----------------------------------|-----------|------|------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 |
| TOTAL SALES | .602 | .699 | | | |
| DEPRECIATION | | .887 | | | |
| OPERATING PROFIT | .715 | .669 | | | |
| NET INTEREST CHARGES | .946 | | | | |
| PRE-TAX PROFIT | .534 | .822 | | | |
| PUBLISHED AFTER TAX PROFIT | .564 | .791 | | | |
| MINORITY INTERESTS | .943 | | | | |
| EARNED FOR ORDINARY | .525 | .822 | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | | -.607 |
| EBIT | .694 | .706 | | | |
| EBITDA | .624 | .774 | | | |
| EQUITY CAP. AND RESERVES | .610 | .762 | | | |
| PREFERENCE CAPITAL | | .470 | .470 | -.587 | |
| TOT. SHARE CAPITAL & RESERVES | .602 | .769 | | | |
| MINORITY INTERESTS | .961 | | | | |
| TOTAL CAPITAL EMPLOYED | .790 | .595 | | | |
| TOT FIXED ASSETS-NET | | .842 | | | |
| TOTAL INTANGIBLES | .891 | | | | |
| TOTAL STOCK AND W.I.P. | .571 | | .503 | | |
| TRADE DEBTORS | | .896 | | | |
| TOTAL CASH & EQUIVALENT | .953 | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | |
|--------------------------------|-------|------|------|-------|
| TOTAL CURRENT ASSETS | .796 | .553 | | |
| ASSETS (TOTAL) | .868 | .488 | | |
| TRADE CREDITORS | .618 | .717 | | |
| BORROWINGS | | | | |
| REPAYABLE < 1 YEAR | .935 | | | |
| TOTAL CURRENT LIABILITIES | .863 | .487 | | |
| NET CURRENT ASSETS | -.922 | | | |
| TOTAL DEBT | .914 | | | |
| NET DEBT | .847 | .486 | | |
| ENTERPRISE VALUE (EV) | .682 | .640 | | |
| MV | .629 | .649 | | |
| TOTAL NO. OF EMPL. (UNITS) | | .668 | .458 | |
| DIVIDENDS PER SHARE | | | .827 | |
| NET EPS | | | .502 | |
| PUBLISHED CASH EPS | | | .819 | |
| BOOK VALUE PER SHARE | | | .908 | |
| MARKET TO BOOK VALUE EX. INTAN | | | | .796 |
| SALES PER SHARE | | | .899 | |
| CASH IN -OPERATING ACTIVITIES | .618 | .776 | | |
| PAYMENTS: FIXED ASSETS | .521 | .826 | | |
| CASH OUT-INVESTING ACTIVITIES | .822 | .548 | | |
| CASH INFLOW FROM FINANCING | .899 | | | |
| NET CASH FLOW | | | | -.630 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.2: Rotated Component Matrix for Year 2001

| Rotated Component Matrix ^a | | | | | | |
|-------------------------------------------|-----------|------|------|-------|------|---|
| | Component | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .750 | .534 | | | | |
| DEPRECIATION | .905 | | | | | |
| OPERATING PROFIT | .772 | .611 | | | | |
| NET INTEREST CHARGES | | .895 | | | | |
| PRE-TAX PROFIT | .855 | | | | | |
| PUBLISHED AFTER TAX PROFIT | .830 | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | .873 | .907 | | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | .835 | | |
| EBIT | .782 | .590 | | | | |
| EBITDA | .844 | .520 | | | | |
| EQUITY CAP. AND RESERVES | .871 | | | | | |
| PREFERENCE CAPITAL | | | .566 | -.496 | | |
| TOT. SHARE CAPITAL & RESERVES | .870 | | | | | |
| MINORITY INTERESTS | | .915 | | | | |
| TOTAL CAPITAL EMPLOYED | .720 | .678 | | | | |
| TOT FIXED ASSETS-NET | .896 | | | | | |
| TOTAL INTANGIBLES | | .823 | | | | |
| TOTAL STOCK AND W.I.P. | | .579 | | | | |
| TRADE DEBTORS | .711 | | | | .579 | |
| TOTAL CASH & EQUIVALENT | | .885 | | | | |
| TOTAL CURRENT ASSETS | .604 | .759 | | | | |
| ASSETS (TOTAL) | .617 | .781 | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | | |
|-----------------------------------|-------|-------|------|-------|------|------|
| TRADE CREDITORS | .644 | .660 | | | | |
| BORROWINGS REPAYABLE < 1 YEAR | .489 | .864 | | | | |
| TOTAL CURRENT LIABILITIES | .588 | .799 | | | | |
| NET CURRENT ASSETS | -.451 | -.793 | | | | |
| TOTAL DEBT | .529 | .841 | | | | |
| NET DEBT | .596 | .775 | | | | |
| ENTERPRISE VALUE (EV) | .761 | .597 | | | | |
| MV | .774 | .547 | | | | |
| TOTAL NO. OF EMPL. (UNITS) | .689 | | | | .458 | |
| DIVIDENDS PER SHARE | | | .802 | | | |
| NET EPS | | | | .768 | | |
| PUBLISHED CASH EPS | | | .840 | | | |
| BOOK VALUE PER SHARE | | | .846 | | | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | | .979 |
| SALES PER SHARE | | | .677 | -.505 | | |
| CASH IN -OPERATING ACTIVITIES | .897 | | | | | |
| PAYMENTS: FIXED ASSETS | .867 | | | | | |
| CASH OUT-INVESTING ACTIVITIES | .628 | .761 | | | | |
| CASH INFLOW FROM FINANCING | | .929 | | | | |
| NET CASH FLOW | | | | | .736 | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.3: Rotated Component Matrix for Year 2002

Rotated Component Matrix^a

| | Component | | | | | |
|-------------------------------------------|-----------|-------|---|-------|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .616 | .736 | | | | |
| DEPRECIATION | | .810 | | | | |
| OPERATING PROFIT | .682 | .692 | | | | |
| NET INTEREST CHARGES | .948 | | | | | |
| PRE-TAX PROFIT | .566 | .738 | | | | |
| PUBLISHED AFTER TAX PROFIT | .614 | .693 | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | .869 | .729 | | | | |
| EXTRAORD. ITEMS AFTER TAX | | -.855 | | | | |
| EBIT | .705 | .653 | | | | |
| EBITDA | .633 | .731 | | | | |
| EQUITY CAP. AND RESERVES | .633 | .729 | | | | |
| PREFERENCE CAPITAL | | | | -.809 | | |
| TOT. SHARE CAPITAL & RESERVES | .634 | .729 | | | | |
| MINORITY INTERESTS | .958 | | | | | |
| TOTAL CAPITAL EMPLOYED | .834 | .533 | | | | |
| TOT FIXED ASSETS-NET | .467 | .708 | | | | |
| TOTAL INTANGIBLES | .900 | | | | | |
| TOTAL STOCK AND W.I.P. | .678 | | | | | |
| TRADE DEBTORS | | .880 | | | | |
| TOTAL CASH & EQUIVALENT | .937 | | | | | |
| TOTAL CURRENT ASSETS | .839 | .533 | | | | |
| ASSETS (TOTAL) | .880 | .464 | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | |
|--------------------------------|-------|------|------|------|-------|
| TRADE CREDITORS | .759 | .578 | | | |
| BORROWINGS | | | | | |
| REPAYABLE < 1 YEAR | .944 | | | | |
| TOTAL CURRENT LIABILITIES | .890 | .453 | | | |
| NET CURRENT ASSETS | -.956 | | | | |
| TOTAL DEBT | .925 | | | | |
| NET DEBT | .905 | | | | |
| ENTERPRISE VALUE (EV) | .657 | .716 | | | |
| MV | .477 | .797 | | | |
| TOTAL NO. OF EMPL. (UNITS) | | .758 | | | |
| DIVIDENDS PER SHARE | | | .482 | | |
| NET EPS | | | | .815 | |
| PUBLISHED CASH EPS | | | .732 | | |
| BOOK VALUE PER SHARE | | | .882 | | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | -.890 |
| SALES PER SHARE | | | .817 | | |
| CASH IN -OPERATING ACTIVITIES | .606 | .773 | | | |
| PAYMENTS: FIXED ASSETS | .675 | .686 | | | |
| CASH OUT-INVESTING ACTIVITIES | .921 | | | | |
| CASH INFLOW FROM FINANCING | .986 | | | | |
| NET CASH FLOW | | | | | .880 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.4: Rotated Component Matrix for Year 2003

Rotated Component Matrix^a

| | Component | | | | | |
|-------------------------------------------|-----------|------|---|------|------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .747 | | | .455 | | |
| DEPRECIATION | .536 | .685 | | | | |
| OPERATING PROFIT | .829 | .472 | | | | |
| NET INTEREST CHARGES | .989 | | | | | |
| PRE-TAX PROFIT | .813 | | | | | |
| PUBLISHED AFTER TAX PROFIT | .852 | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | .863 | | | | | |
| EXTRAORD. ITEMS AFTER TAX | .829 | .906 | | | | |
| EBIT | .898 | | | | | |
| EBITDA | .835 | | | | | |
| EQUITY CAP. AND RESERVES | .660 | .701 | | | | |
| PREFERENCE CAPITAL | | | | | .813 | |
| TOT. SHARE CAPITAL & RESERVES | .660 | .702 | | | | |
| MINORITY INTERESTS | .991 | | | | | |
| TOTAL CAPITAL EMPLOYED | .918 | | | | | |
| TOT FIXED ASSETS-NET | .658 | .595 | | | | |
| TOTAL INTANGIBLES | .621 | .604 | | | | |
| TOTAL STOCK AND W.I.P. | .631 | | | | .491 | |
| TRADE DEBTORS | | | | .776 | | |
| TOTAL CASH & EQUIVALENT | .983 | | | | | |
| TOTAL CURRENT ASSETS | .930 | | | | | |
| ASSETS (TOTAL) | .954 | | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | |
|-----------------------------------|-------|-------|------|------|------|
| TRADE CREDITORS | .875 | | | | |
| BORROWINGS REPAYABLE < 1 YEAR | .988 | | | | |
| TOTAL CURRENT LIABILITIES | .961 | | | | |
| NET CURRENT ASSETS | -.903 | | | | |
| TOTAL DEBT | .988 | | | | |
| NET DEBT | .985 | | | | |
| ENTERPRISE VALUE (EV) | .785 | .523 | | | |
| MV | .634 | .651 | | | |
| TOTAL NO. OF EMPL. (UNITS) | .528 | | | .567 | |
| DIVIDENDS PER SHARE | | | .692 | | |
| NET EPS | | | .739 | | |
| PUBLISHED CASH EPS | | | .831 | | |
| BOOK VALUE PER SHARE | | | .817 | | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | .778 |
| SALES PER SHARE | | | .545 | .606 | |
| CASH IN -OPERATING ACTIVITIES | .782 | .517 | | | |
| PAYMENTS: FIXED ASSETS | .786 | .466 | | | |
| CASH OUT-INVESTING ACTIVITIES | .951 | | | | |
| CASH INFLOW FROM FINANCING | | -.927 | | | |
| NET CASH FLOW | .831 | | | | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.5: Rotated Component Matrix for Year 2004

| Rotated Component Matrix ^a | | | | | | |
|-------------------------------------------|-----------|------|---|---|------|---|
| | Component | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .932 | | | | | |
| DEPRECIATION | .894 | | | | | |
| OPERATING PROFIT | .984 | | | | | |
| NET INTEREST CHARGES | .761 | .617 | | | | |
| PRE-TAX PROFIT | .985 | | | | | |
| PUBLISHED AFTER TAX PROFIT | .989 | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | .755 | .588 | | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | | | |
| EBIT | .982 | | | | | |
| EBITDA | .981 | | | | | |
| EQUITY CAP. AND RESERVES | .972 | | | | | |
| PREFERENCE CAPITAL | | | | | .910 | |
| TOT. SHARE CAPITAL & RESERVES | .972 | | | | | |
| MINORITY INTERESTS | .760 | .603 | | | | |
| TOTAL CAPITAL EMPLOYED | .905 | | | | | |
| TOT FIXED ASSETS-NET | .834 | | | | | |
| TOTAL INTANGIBLES | .916 | | | | | |
| TOTAL STOCK AND W.I.P. | .817 | | | | | |
| TRADE DEBTORS | .728 | | | | | |
| TOTAL CASH & EQUIVALENT | .842 | .483 | | | | |
| TOTAL CURRENT ASSETS | .919 | | | | | |
| ASSETS (TOTAL) | .887 | | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | |
|--------------------------------|-------|-------|------|------|------|
| TRADE CREDITORS | .865 | | | | |
| BORROWINGS | | | | | |
| REPAYABLE < 1 YEAR | .818 | .538 | | | |
| TOTAL CURRENT LIABILITIES | .882 | | | | |
| NET CURRENT ASSETS | -.452 | -.832 | | | |
| TOTAL DEBT | .815 | .554 | | | |
| NET DEBT | .788 | .597 | | | |
| ENTERPRISE VALUE (EV) | .962 | | | | |
| MV | .989 | | | | |
| TOTAL NO. OF EMPL. (UNITS) | .810 | | | | |
| DIVIDENDS PER SHARE | | | .562 | | |
| NET EPS | | | .860 | | |
| PUBLISHED CASH EPS | | | .902 | | |
| BOOK VALUE PER SHARE | | | .780 | | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | .914 |
| SALES PER SHARE | | | .766 | | |
| CASH IN -OPERATING ACTIVITIES | .967 | | | | |
| PAYMENTS: FIXED ASSETS | .918 | | | | |
| CASH OUT-INVESTING ACTIVITIES | .862 | | | | |
| CASH INFLOW FROM FINANCING | | .870 | | | |
| NET CASH FLOW | | | | .790 | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.6: Rotated Component Matrix for Year 2005

Rotated Component Matrix^a

| | Component | | | | |
|----------------------------------|-----------|------|---|------|------|
| | 1 | 2 | 3 | 4 | 5 |
| TOTAL SALES | .630 | .689 | | | |
| DEPRECIATION | | .869 | | | |
| OPERATING PROFIT | .737 | .663 | | | |
| NET INTEREST CHARGES | .960 | | | | |
| PRE-TAX PROFIT | .625 | .743 | | | |
| PUBLISHED AFTER TAX PROFIT | .685 | .704 | | | |
| MINORITY INTERESTS | .878 | | | | |
| EARNED FOR ORDINARY | .609 | .762 | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | | .687 |
| EBIT | .775 | .616 | | | |
| EBITDA | .711 | .695 | | | |
| EQUITY CAP. AND RESERVES | .609 | .772 | | | |
| PREFERENCE CAPITAL | | | | .843 | |
| TOT. SHARE CAPITAL & RESERVES | .608 | .772 | | | |
| MINORITY INTERESTS | .965 | | | | |
| TOTAL CAPITAL EMPLOYED | .895 | | | | |
| TOT FIXED ASSETS-NET | .576 | .681 | | | |
| TOTAL INTANGIBLES | .694 | .643 | | | |
| TOTAL STOCK AND W.I.P. | .616 | .506 | | | |
| TRADE DEBTORS | | .770 | | | |
| TOTAL CASH & EQUIVALENT | .822 | .517 | | | |
| TOTAL CURRENT ASSETS | .657 | .695 | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | |
|-----------------------|-------|------|------|-------|
| ASSETS (TOTAL) | .866 | .491 | | |
| TRADE CREDITORS | .784 | .503 | | |
| BORROWINGS | | | | |
| REPAYABLE < 1 YEAR | .950 | | | |
| TOTAL CURRENT | | | | |
| LIABILITIES | .893 | | | |
| NET CURRENT ASSETS | -.965 | | | |
| TOTAL DEBT | .942 | | | |
| NET DEBT | .952 | | | |
| ENTERPRISE VALUE (EV) | .832 | .551 | | |
| MV | .682 | .714 | | |
| TOTAL NO. OF EMPL. | | | | |
| (UNITS) | | .737 | | |
| DIVIDENDS PER SHARE | | | .520 | |
| NET EPS | | | .794 | |
| PUBLISHED CASH EPS | | | .826 | |
| BOOK VALUE PER SHARE | | | .799 | |
| MARKET TO BOOK VALUE | | | | .556 |
| EX. INTAN | | | | |
| SALES PER SHARE | | | .756 | |
| CASH IN -OPERATING | | | | |
| ACTIVITIES | .690 | .716 | | |
| PAYMENTS: FIXED | | | | |
| ASSETS | .775 | .587 | | |
| CASH OUT-INVESTING | | | | |
| ACTIVITIES | .916 | | | |
| CASH INFLOW FROM | | | | |
| FINANCING | | | | -.931 |
| NET CASH FLOW | -.656 | | | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.7: Rotated Component Matrix for Year 2006

| | | Rotated Component Matrix ^a | | | | | | |
|-------------------------------------------|--|---------------------------------------|------|---|------|------|------|---|
| | | Component | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| TOTAL SALES | | .731 | .553 | | | | | |
| DEPRECIATION | | .451 | .865 | | | | | |
| OPERATING PROFIT | | .828 | .499 | | | | | |
| NET INTEREST CHARGES | | .956 | | | | | | |
| PRE-TAX PROFIT | | .712 | .550 | | | | | |
| PUBLISHED AFTER TAX PROFIT | | .759 | .489 | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | | .957 | | | | | | |
| EXTRAORD. ITEMS AFTER TAX | | .719 | .558 | | | | | |
| EBIT | | | | | .951 | | | |
| EBITDA | | .848 | .470 | | | | | |
| EQUITY CAP. AND RESERVES | | .779 | .580 | | | | | |
| PREFERENCE CAPITAL | | .472 | .850 | | | | | |
| TOT. SHARE CAPITAL & RESERVES | | | | | | | .967 | |
| MINORITY INTERESTS | | .472 | .849 | | | | | |
| TOTAL CAPITAL EMPLOYED | | .971 | | | | | | |
| TOT FIXED ASSETS-NET | | .801 | .587 | | | | | |
| TOTAL INTANGIBLES | | | .876 | | | | | |
| TOTAL STOCK AND W.I.P. | | | .916 | | | | | |
| TRADE DEBTORS | | .738 | | | | | | |
| TOTAL CASH & EQUIVALENT | | | .655 | | | .537 | | |
| TOTAL CURRENT ASSETS | | .874 | | | | | | |
| ASSETS (TOTAL) | | .737 | .521 | | | | | |
| | | .828 | .555 | | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | | |
|-----------------------------------|-------|------|------|--|-------|-------|
| TRADE CREDITORS | .801 | .473 | | | | |
| BORROWINGS REPAYABLE < 1 YEAR | .963 | | | | | |
| TOTAL CURRENT LIABILITIES | .917 | | | | | |
| NET CURRENT ASSETS | -.920 | | | | | |
| TOTAL DEBT | .940 | | | | | |
| NET DEBT | .933 | | | | | |
| ENTERPRISE VALUE (EV) | .823 | .556 | | | | |
| MV | .653 | .693 | | | | |
| TOTAL NO. OF EMPL. (UNITS) | | .722 | | | | |
| DIVIDENDS PER SHARE | | | .547 | | | |
| NET EPS | | | .791 | | | |
| PUBLISHED CASH EPS | | | .867 | | | |
| BOOK VALUE PER SHARE | | | .814 | | | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | | .967 |
| SALES PER SHARE | | | .759 | | | |
| CASH IN -OPERATING ACTIVITIES | .657 | .660 | | | | |
| PAYMENTS: FIXED ASSETS | .766 | .621 | | | | |
| CASH OUT-INVESTING ACTIVITIES | .898 | | | | | |
| CASH INFLOW FROM FINANCING | .682 | | | | -.630 | |
| NET CASH FLOW | | | | | | -.873 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.8: Rotated Component Matrix for Year 2007

| Rotated Component Matrix ^a | | | | | | |
|---------------------------------------|-----------|------|---|------|-------|------|
| | Component | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .810 | | | | | |
| DEPRECIATION | .987 | | | | | |
| OPERATING PROFIT | .735 | .633 | | | | |
| NET INTEREST CHARGES | | .891 | | | | |
| PRE-TAX PROFIT | .824 | | | | | |
| PUBLISHED AFTER TAX PROFIT | .770 | .528 | | | | |
| MINORITY INTERESTS | | .916 | | | | |
| EARNED FOR ORDINARY | .785 | .506 | | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | | -.817 | |
| EBIT | .719 | .657 | | | | |
| EBITDA | .848 | .504 | | | | |
| EQUITY CAP. AND RESERVES | .926 | | | | | |
| PREFERENCE CAPITAL | | | | | | .931 |
| TOT. SHARE CAPITAL & RESERVES | .926 | | | | | |
| MINORITY INTERESTS | | .933 | | | | |
| TOTAL CAPITAL EMPLOYED | .685 | .723 | | | | |
| TOT FIXED ASSETS-NET | .928 | | | | | |
| TOTAL INTANGIBLES | .948 | | | | | |
| TOTAL STOCK AND W.I.P. | | .640 | | | | .466 |
| TRADE DEBTORS | .686 | | | .525 | | |
| TOTAL CASH & EQUIVALENT | .474 | .752 | | | | |
| TOTAL CURRENT ASSETS | .626 | .570 | | .451 | | |
| ASSETS (TOTAL) | .658 | .745 | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | |
|-----------------------------------|------|-------|------|------|--|
| TRADE CREDITORS | .589 | .663 | | | |
| BORROWINGS REPAYABLE < 1 YEAR | | .911 | | | |
| TOTAL CURRENT LIABILITIES | .519 | .834 | | | |
| NET CURRENT ASSETS | | -.915 | | | |
| TOTAL DEBT | .462 | .881 | | | |
| NET DEBT | .454 | .886 | | | |
| ENTERPRISE VALUE (EV) | .692 | .695 | | | |
| MV | .834 | | | | |
| TOTAL NO. OF EMPL. (UNITS) | .754 | | | | |
| DIVIDENDS PER SHARE | | | .517 | | |
| NET EPS | | | .886 | | |
| PUBLISHED CASH EPS | | | .901 | | |
| BOOK VALUE PER SHARE | | | .827 | | |
| MARKET TO BOOK VALUE EX. INTAN | | | | .741 | |
| SALES PER SHARE | | | .729 | | |
| CASH IN -OPERATING ACTIVITIES | .865 | .470 | | | |
| PAYMENTS: FIXED ASSETS | .892 | | | | |
| CASH OUT-INVESTING ACTIVITIES | .553 | .821 | | | |
| CASH INFLOW FROM FINANCING | | .942 | | | |
| NET CASH FLOW | | | | .912 | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.9: Rotated Component Matrix for Year 2008

| Rotated Component Matrix ^a | | | | | | |
|-------------------------------------------|-----------|------|---|---|------|---|
| | Component | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .805 | .485 | | | | |
| DEPRECIATION | .967 | | | | | |
| OPERATING PROFIT | .790 | .569 | | | | |
| NET INTEREST CHARGES | | .912 | | | | |
| PRE-TAX PROFIT | .900 | | | | | |
| PUBLISHED AFTER TAX PROFIT | .835 | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | .556 | .755 | | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | | | |
| EBIT | .763 | .607 | | | | |
| EBITDA | .858 | .494 | | | | |
| EQUITY CAP. AND RESERVES | .883 | | | | | |
| PREFERENCE CAPITAL | | | | | .944 | |
| TOT. SHARE CAPITAL & RESERVES | .883 | | | | | |
| MINORITY INTERESTS | | .946 | | | | |
| TOTAL CAPITAL EMPLOYED | .627 | .776 | | | | |
| TOT FIXED ASSETS-NET | .890 | | | | | |
| TOTAL INTANGIBLES | .934 | | | | | |
| TOTAL STOCK AND W.I.P. | | .702 | | | | |
| TRADE DEBTORS | .719 | | | | | |
| TOTAL CASH & EQUIVALENT | | .849 | | | | |
| TOTAL CURRENT ASSETS | .586 | .708 | | | | |
| ASSETS (TOTAL) | .621 | .782 | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | |
|-----------------------------------|------|-------|------|-------|-------|
| TRADE CREDITORS | .585 | .710 | | | |
| BORROWINGS REPAYABLE < 1 YEAR | | .911 | | | |
| TOTAL CURRENT LIABILITIES | .515 | .845 | | | |
| NET CURRENT ASSETS | | -.900 | | | |
| TOTAL DEBT | | .891 | | | |
| NET DEBT | | .891 | | | |
| ENTERPRISE VALUE (EV) | .698 | .697 | | | |
| MV | .905 | | | | |
| TOTAL NO. OF EMPL. (UNITS) | .781 | | | | |
| DIVIDENDS PER SHARE | | | .664 | | |
| NET EPS | | | .871 | | |
| PUBLISHED CASH EPS | | | .884 | | |
| BOOK VALUE PER SHARE | | | | -.759 | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | -.764 |
| SALES PER SHARE | | | | | .569 |
| CASH IN -OPERATING ACTIVITIES | .855 | .497 | | | |
| PAYMENTS: FIXED ASSETS | .891 | | | | |
| CASH OUT-INVESTING ACTIVITIES | .826 | .545 | | | |
| CASH INFLOW FROM FINANCING | | .938 | | | |
| NET CASH FLOW | | .945 | | | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.10: Rotated Component Matrix for Year 2009

| | | Rotated Component Matrix ^a | | | | | | |
|----------------------------------------|--|---------------------------------------|------|---|---|---|------|------|
| | | Component | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| TOTAL SALES | | .815 | .517 | | | | | |
| DEPRECIATION | | .892 | | | | | | |
| OPERATING PROFIT | | .862 | .484 | | | | | |
| NET INTEREST CHARGES | | | .922 | | | | | |
| PRE-TAX PROFIT | | .930 | | | | | | |
| PUBLISHED AFTER TAX PROFIT | | .889 | | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | | .625 | | | | | | |
| EXTRAORD. ITEMS AFTER TAX | | | | | | | | .716 |
| EBIT | | .849 | .478 | | | | | |
| EBITDA | | .898 | | | | | | |
| EQUITY CAP. AND RESERVES | | .839 | .456 | | | | | |
| PREFERENCE CAPITAL | | | | | | | .870 | |
| TOT. SHARE CAPITAL & RESERVES | | .838 | .455 | | | | | |
| MINORITY INTERESTS | | | .952 | | | | | |
| TOTAL CAPITAL EMPLOYED | | .557 | .812 | | | | | |
| TOT FIXED ASSETS-NET | | .827 | | | | | | |
| TOTAL INTANGIBLES | | .901 | | | | | | |
| TOTAL STOCK AND W.I.P. | | | .542 | | | | | |
| TRADE DEBTORS | | .807 | | | | | | |
| TOTAL CASH & EQUIVALENT | | | .917 | | | | | |
| TOTAL CURRENT ASSETS | | .562 | .790 | | | | | |
| ASSETS (TOTAL) | | .578 | .803 | | | | | |

Do Fundamental Factors Explain Stock Returns

| | | | | | | |
|-----------------------------------|------|-------|------|-------|------|-------|
| TRADE CREDITORS | .589 | .711 | | | | |
| BORROWINGS REPAYABLE < 1 YEAR | | .955 | | | | |
| TOTAL CURRENT LIABILITIES | .503 | .861 | | | | |
| NET CURRENT ASSETS | | -.621 | .745 | | | |
| TOTAL DEBT | | .924 | | | | |
| NET DEBT | | .919 | | | | |
| ENTERPRISE VALUE (EV) | .695 | .708 | | | | |
| MV | .905 | | | | | |
| TOTAL NO. OF EMPL. (UNITS) | .790 | | | | | |
| DIVIDENDS PER SHARE | | | .719 | | | |
| NET EPS | | | .832 | | | |
| PUBLISHED CASH EPS | | | .914 | | | |
| BOOK VALUE PER SHARE | | | .624 | | .525 | |
| MARKET TO BOOK VALUE EX. INTAN | | | | | .866 | |
| SALES PER SHARE | | | .485 | | | -.578 |
| CASH IN -OPERATING ACTIVITIES | .948 | | | | | |
| PAYMENTS: FIXED ASSETS | .837 | | | -.452 | | |
| CASH OUT-INVESTING ACTIVITIES | | -.845 | | | | |
| CASH INFLOW FROM FINANCING | | -.768 | | | | |
| NET CASH FLOW | | .938 | | | | |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4.1.11: Rotated Component Matrix for Year 2010

Rotated Component Matrix^a

| | Component | | | | | |
|-------------------------------------------|-----------|-------|---|------|------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| TOTAL SALES | .858 | | | | | |
| DEPRECIATION | .975 | | | | | |
| OPERATING PROFIT | .841 | .463 | | | | |
| NET INTEREST CHARGES | .486 | .860 | | | | |
| PRE-TAX PROFIT | .865 | | | | | |
| PUBLISHED AFTER TAX PROFIT | .923 | | | | | |
| MINORITY INTERESTS EARNED FOR ORDINARY | .626 | .632 | | | | |
| EXTRAORD. ITEMS AFTER TAX | | -.923 | | | | |
| EBIT | .843 | | | | | |
| EBITDA | .930 | | | | | |
| EQUITY CAP. AND RESERVES | .906 | | | | | |
| PREFERENCE CAPITAL | | | | | .845 | |
| TOT. SHARE CAPITAL & RESERVES | .906 | | | | | |
| MINORITY INTERESTS | | .914 | | | | |
| TOTAL CAPITAL EMPLOYED | .661 | .743 | | | | |
| TOT FIXED ASSETS-NET | .917 | | | | | |
| TOTAL INTANGIBLES | .955 | | | | | |
| TOTAL STOCK AND W.I.P. | .454 | .551 | | .519 | | |
| TRADE DEBTORS | .717 | | | | | |
| TOTAL CASH & EQUIVALENT | | .889 | | | | |
| TOTAL CURRENT ASSETS | .577 | .762 | | | | |
| ASSETS (TOTAL) | .673 | .736 | | | | |

Do Fundamental Factors Explain Stock Returns

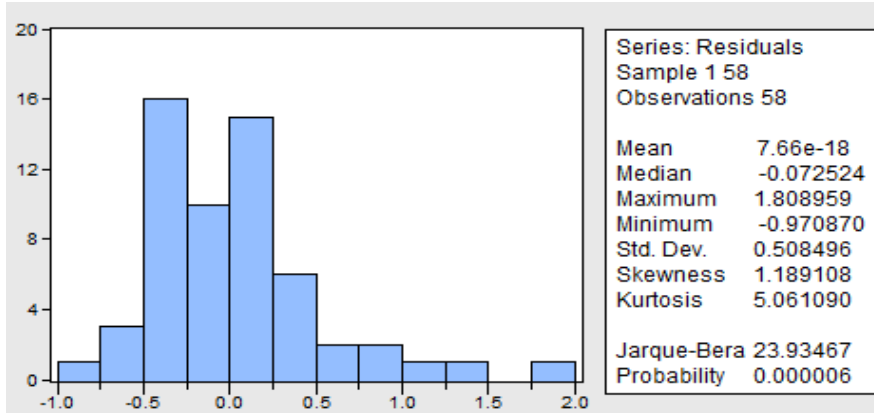
| | | | | | |
|--------------------------------|------|------|------|------|------|
| TRADE CREDITORS | .664 | .547 | | | |
| BORROWINGS | | .906 | | | |
| REPAYABLE < 1 YEAR | | | | | |
| TOTAL CURRENT LIABILITIES | .591 | .793 | | | |
| NET CURRENT ASSETS | | | | .971 | |
| TOTAL DEBT | .467 | .878 | | | |
| NET DEBT | .477 | .865 | | | |
| ENTERPRISE VALUE (EV) | .750 | .630 | | | |
| MV | .860 | | | | |
| TOTAL NO. OF EMPL. (UNITS) | .740 | | | | |
| DIVIDENDS PER SHARE | | | .684 | | |
| NET EPS | | | .905 | | |
| PUBLISHED CASH EPS | | | .876 | | |
| BOOK VALUE PER SHARE | | | | | .809 |
| MARKET TO BOOK VALUE EX. INTAN | | | | | -729 |
| SALES PER SHARE | | | | | .657 |
| CASH IN -OPERATING ACTIVITIES | .910 | | | | |
| PAYMENTS: FIXED ASSETS | .922 | | | | |
| CASH OUT-INVESTING ACTIVITIES | | | | | -935 |
| CASH INFLOW FROM FINANCING | -593 | -790 | | | |
| NET CASH FLOW | | .779 | | | |

Extraction Method: Principal Component Analysis.

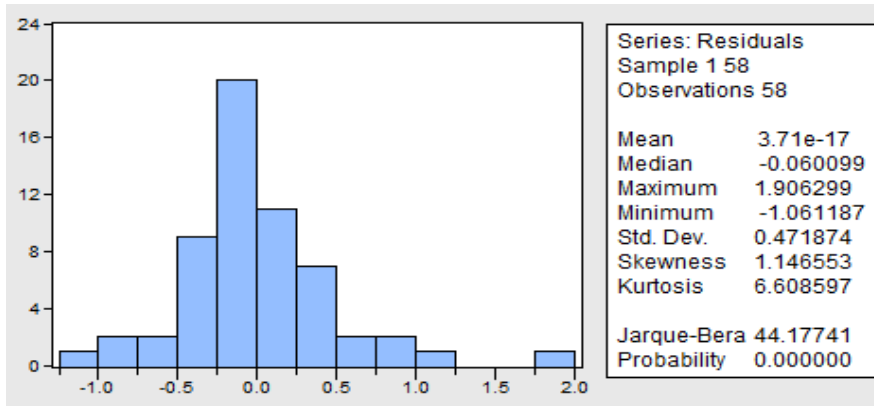
Rotation Method: Varimax with Kaiser Normalization.

Table 4.3.2.1: Jarque-Bera Normality Test Results

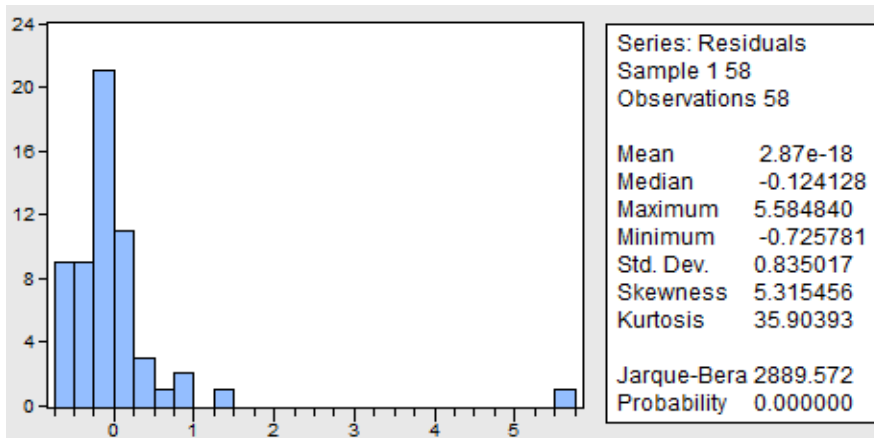
Year 2000



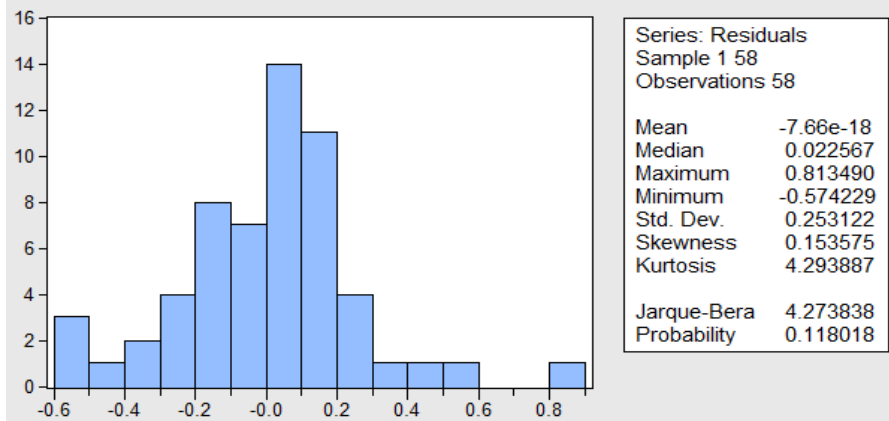
Year 2001



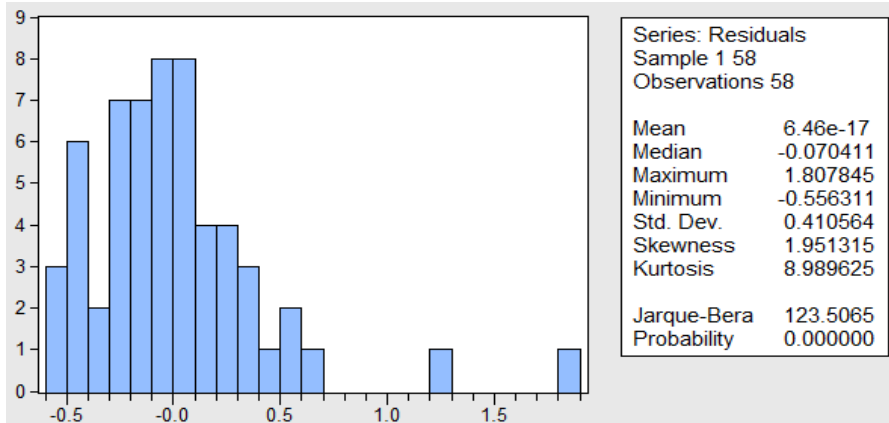
Year 2002



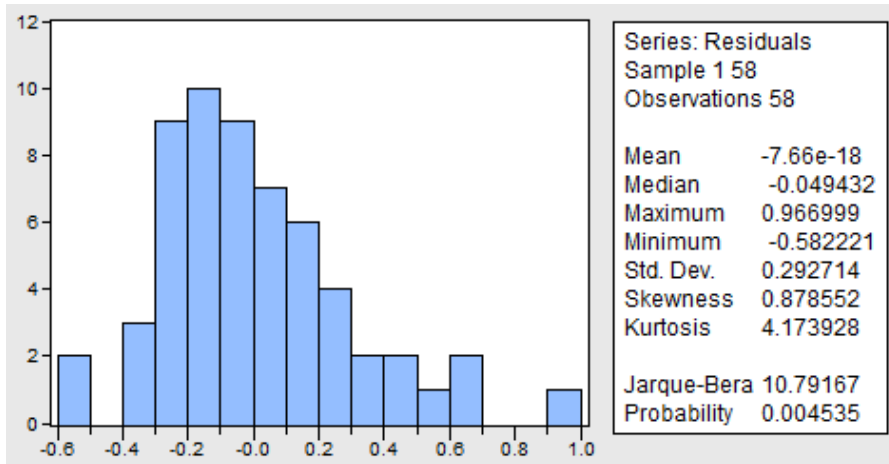
Year 2003



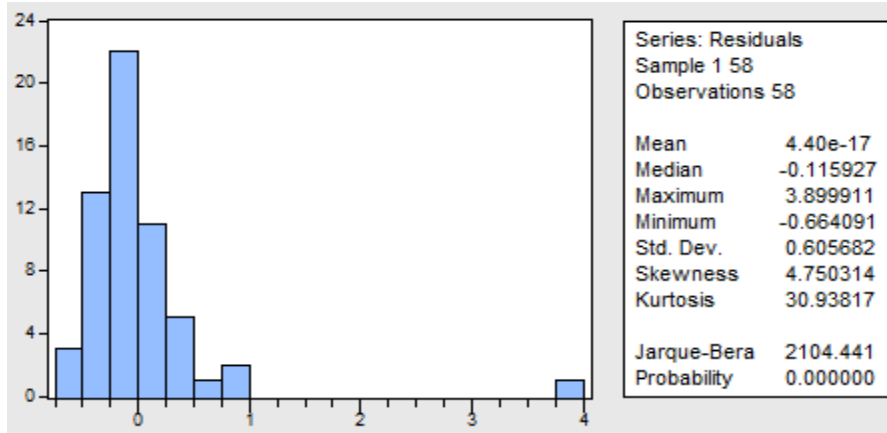
Year 2004



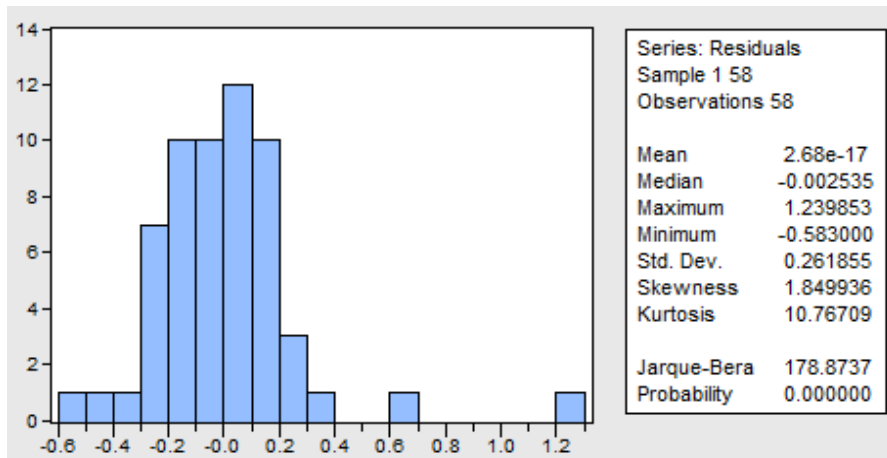
Year 2005



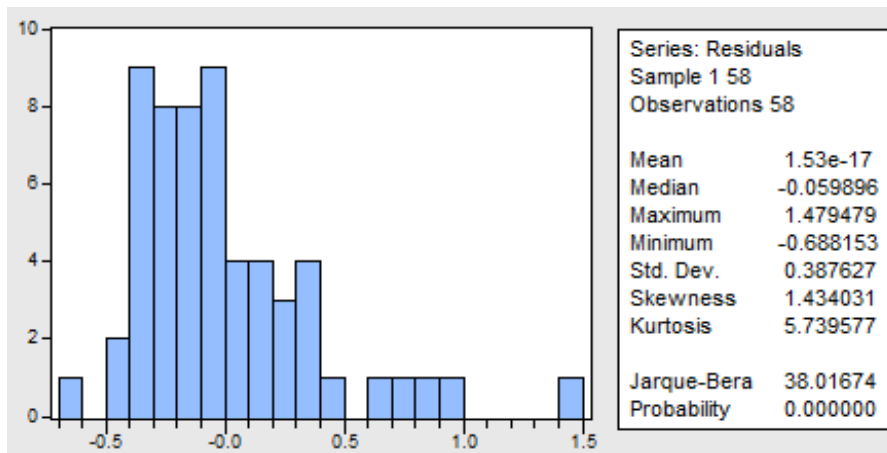
Year 2006



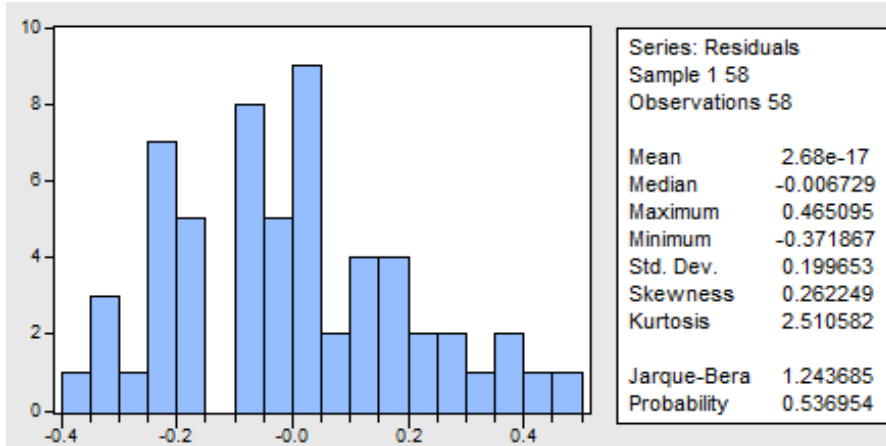
Year 2007



Year 2008



Year 2009



Year 2010

