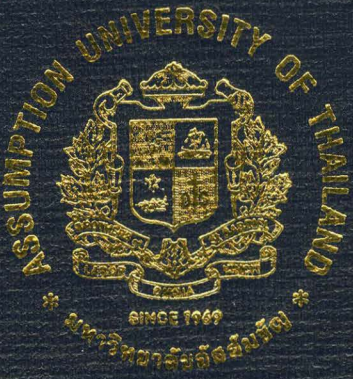

The Relationship between Financial Factors and Systematic Risk: A Case Study of Companies Listed in Shenzhen Stock Exchange in China During the Period 2009 to 2011

Ms. Meng Zhang

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Business Administration in Finance
Graduate School of Business
Assumption University
Academic Year 2013

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By	Ms. Meng Zhang
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Abstract

The amount of information about systematic risks that financial ratio measures convey help accountants to develop financial ratios measures of greater usefulness to business managers and investors. The objective of this research is to study the relationship between financial factors and systematic risks in all companies listed in Shenzhen Stock Exchange in China during the period 2009 to 2011. This study uses eleven financial factors which are firm size, asset growth rate, leverage (debt to equity), liquidity (quick ratio), profitability (return on asset and return on equity), operating efficiency (total asset turnover), asset liability ratio, dividend payout, asset efficiency ratio and asset coverage ratio as independent variables influencing systematic risks. Ordinary least square method was used to analyze the relationship of each year. Eleven financial factors were calculated from related accounting of each firm's financial reports of all the companies listed in Shenzhen Stock market and systematic risk was also measured by the return of market and return of stock price for each firm.

The result of the research showed that firm size has a positive relationship with systematic risk and the liquidity (quick ratio) has a negative relationship with systematic risk in year 2009. In the year 2010, the liquidity (quick ratio) also had a negative relationship with systematic risk and firm size that has a positive relationship with the systematic risk. Several factors, which are the firm size, profitability (return on asset), dividend payout, have negative relationship with systematic risk; growth rate, leverage (debt to equity), profitability (return on equity), and asset coverage ratio, have positive significant relationships with the systematic risk in the year 2011. Future studies might focus on the same variables but can change to other industries within China or other country. Use Time series and panel data may create different result, as the frequency of data may change from being yearly to quarterly or even monthly.

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This thesis has been completed with help from a number of extraordinary individuals who gave me their help, strong support, suggestion and help from many different ways and the researcher would like to thank Assumption University of Thailand for providing me the opportunity for me to be a quality graduate.

First and foremost, I am deeply gratefully and sincerely thank my advisor Dr. Witsaroot Pariyaprasert who gave me good advice, supported, and assisted with patience, understanding and encouraged the researcher from the conception of the topic right during graduate studies. This thesis could not successfully be completed without the kindness of my advisor. Moreover, he has also been a mentor.

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Meng Zhang

August, 2013

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CHAPTER 1

GENERALITIES OF THE STUDY

This chapter gives information about the systematic risk and its determinant variables. The first part introduces important terms, such as “systematic risk”. The following is an important introduction to Capital Asset Pricing Model (CAPM). This chapter also consists of a short review on the stock market of China.

1.1 Introduction to the Study

In financial securities’ estimation, a very vital role and important aspect is associated to systematic risk. Generally, in financial economics show the importance of incorporating a risk factor when valuing a financial security in established theoretical and empirical studies. The most well known measure of financial risk is the systematic risk measured by Beta. Beta is creates a link between the stock market primarily thought investors’ expectations and firm’s decision. If firms make a wrong decision, it affects the investors’ expectations about the value of its stock. The Beta of the market has the value of 1.0. A Beta greater than 1 means the price of the investment is expected to move up more than the market price when the market goes up and drops more when the market declines.

Since Beta creates a link between the firm and the stock market, an interesting issue to examine is the relationship between the financial factors and systematic risk (Beta). Changes in a firm’s financial information published in the financial report also affect changes in stock prices, it is the foundation of this relationship. Each firm’s financial information must be coveyed to investors to help them reach the real value of the common stock.

Capital asset pricing model (Sharp, 1963) shows that systematic risk and unsystematic risk are associated with all companies. In accounting research,

particularly in capital markets research, systematic risk is very important. Unsystematic risk is linked with an individual firm while systematic risk is related with the market (Rowe and Kim, 2010). Systematic risk is covariance of stock returns of the capital market and measured through Beta, it the changes with market returns and stock returns (Gu and Kim, 2002), as Beta makes the association among company decisions and stock market and it is also a function of stock return. So, Beta as a factor has a vital role. As a high systematic risk will affects the value of the stock negatively. Capital Asset Pricing Model (CAPM) suggests that the appropriate risk measurement is the systematic risk (Beta) and it shows that the risk premium for a particular stock is a function of that security's Beta and the difference between the expected market rate of return and the risk free rate of return. Assumptions for Capital Asset Pricing model are as follows:

(1) All investors are single-period, risk-averse maximize the expected utility of terminal wealth.

(2) They find it possible to make their optimal portfolio decisions solely on the basis of the mean and standard deviation of the probability distribution of terminal wealth associated with the various portfolios.

(3) They all have the same decision horizon and over this period the mean and standard deviation of the probability distributions exist.

(4) They have homogeneous expectations regarding the mean and standard deviation of the probability distributions, and

(5) There are perfect capital markets.

From these assumptions, the capital asset pricing model follows as, in equilibrium, stocks will be priced so that:

$$E(R_{it}) = R_{ft} + \beta(R_{mt} - R_{ft}) \quad (1.1)$$

Where:

R_{it} = return on stock i in time period t.

R_{ft} = return on the risk-free asset.

R_{mt} = return on the market portfolio in time period t.

While unsystematic risks can be removed or lowered with the help of diversification, applying diversification techniques to any security the systematic risk cannot be eliminated. Any company's financial market evaluation, production and marketing policies are related to systematic risks (Logue and Merville, 1972). In Capital Asset Pricing Model (CAPM), systematic risk is a relevant factor to determine the required return of an investor, but unsystematic risk is not considered (Gu and Kim, 2002).

During the previous decade, studies investigated the determinants of systematic risk of a firm's security. The focus was on the relationship between financial characteristics of the firm and the systematic risk of the firm's security. So, stock prices were affected by systematic risks and unsystematic risks. The behavior of stock prices and returns may provide information on the market assessment of the firm's investment opportunities and financial policies; financial executives in the firm need to be concerned with what factors affect their firm's systematic risk and need to know how to address and adjust these factors as necessary to satisfy their shareholders. However, diversified investors were concerned only with the systematic risk and required a higher rate of return for stock that has a higher systematic risk. By understanding how these decisions affect financial ratios and how these financial ratios affect the systematic risk of the company, the executives will be able to manage the risk of the firm's stock price and in turn, increase the wealth of shareholders.

Several previous studies have determined the different financial variables which affect systematic risk. Most studies have found a relationship between systematic risk and financial factors in different industries (Beaver et al., 1970, Lee and Jang, 2006, Gu and Kim, 2002). Logue and Merville (1972) estimated that profitability has been related with debt ratio and a firm's asset size. Lee and Jang (2007) concluded significant results with systematic risks in the US airline industries. Rowe and Kim (2010) used data of casino industries to estimate the association between systematic risks (Beta) and financial factors. Different studies have investigated the determining of systematic risk in the different industries and systematic risk might change in various industries. Gu and Kim (2002) studied the determinants of systematic risks (Beta) in the restaurant industry. Patel and Olsen (1984) showed financial determinants on "real estate investment trusts". Olib et al. (2008) found the association between Beta and international diversification. The details of all determinants factors have been discussed in Chapter two.

This study aims at examining the effects of financial factors on systematic risk, and investigating whether certain financial variables influence the firm's systematic risk in all of China's listed companies at Shenzhen Stock Exchange Market. In order to make the most significant financial information to be published in the firm's financial reports and control and manage systematic risk, to create an informative link between financial reporting and systematic risk and also certain policy-level implications regarding the scope of transparency that shows what is to be considered a compulsory financial information to be included in financial reporting. Using this information helps investors better understand risk how affects their investment; for executives to understand how financial factors affect a firm's Beta would enable them to implement policies and strategies that can reduce risk and enhance a firm's value, and financing policies can affect its business and financial risk and eventually its systematic risk. The eleven variables selected in this study were based on the previous studies discussed and depend on data information published in the Shenzhen stock market. Finally, a summary from these two factors, the following specific ratios were

selected to represent each financial variable: (1) firm size, (2) asset growth rate, (3) leverage (debt to equity), (4) liquidity (quick ratio), (5) profitability (return on asset), (6) profitability (return on equity), (7) operating efficiency (total asset turnover), (8) assets liability ratio, (9) dividend payout, (10) asset efficiency ratio, (11) asset coverage ratio. The financial ratios' data from each listed company's financial statement, such as: balance sheet, income statement and cash flow of financial statement on Shenzhen stock market are calculated.

1.2 Introduction to Chinese Stock Market

The following is a brief introduction to China's stock market.

In the early 1970s the Cultural Revolution ended; after eight years. In the year 1978, a number of companies began trading in securities with foreign firms again, prompting a surge in economic reform and continued development of business. So, China reopened itself to foreigners. During 1980s, a socialist market economy was established, and it finally, led to the Shanghai Stock Exchange to be reopened in 1990. At the same year, a secondary exchange in Shenzhen of China was opened, aiming more at technology and government securities.

Between end-1999 and early 2000 was the first bust in China's Stock Exchange Market, and between mid-2004 and mid-2005 was the second one. We also have had two booms, starting in the Autumn of 2006 and ended in early 2008 was the first boom and other one was a shorter stock market boom which occurred around mid-2009. While asset price bubbles, being either rational or irrational, were often used as explanations for booms in Chinese stock market (Wei and You, 2007).

Two stock markets have emerged in the People's Republic of China. The Shanghai Stock Exchange (SSE) and the Shenzhen (SZSE) operate Monday to Friday

each week except holidays in China, from nine thirty to eleven o'clock in the morning and in the afternoon from one thirty to three o'clock. There are two major Stock Exchange Markets in China's government financial revolution. The majority of listed companies in these two stock markets are state-owned enterprises (SOEs) which are large and medium sized companies. 'A' shares, are for domestic investors in China and the trade currency is RMB (Yuan). Other one is 'B' shares (shares designed for overseas investors in U.S. dollars on the Shanghai market and in Hong Kong Yuan on the Shenzhen market). However, in March 2001, the 'B' share market was also opened to Chinese citizens. The 'A' shares consist of government's state-owned shares, state-owned institutions legal-person shares owned and negotiable shares owned by individual domestic investors. State shares and legal-person shares account for more than 60% of the total shares and they are not tradable on the stock market because the government must retain control of these A-share companies. So, only negotiable shares are only class 'A' shares that can be publicly traded on the stock exchange (http://history.cultural-china. com/en/34History6633.html, accessed on 23 December 2012).

1.2.1 Shanghai Stock Exchange.

The Shanghai Stock Exchange (SSE) was founded and began operation on November 26th, and on December 19th, 1990. The SSE bases its development on the principle of "legislation, supervision, self-regulation and standardization" to create a transparent, open, safe and efficient marketplace. For the securities trading, formulating business rules, accepting and arranging listings, organizing and monitoring securities trading; regulating members and listed companies, and managing and disseminating market information, the SSE providing marketplace and facilities and try to realize a variety of functions (http://www.sse.com.cn/ sseportal/en /c01/p996/c1501p996.shtml, accessed on 23 December 2012).

After several years of operation, The SSE has also become the most excellent

stock exchange market in China in terms of the number of listed companies, over 71.30 million investors and 860 listed companies until December 2007 ended. The SSE's total market capitalization hit RMB 26.98 trillion. In 2007, the capital were raised from the SSE market exceeded RMB by 661.6 billion. The key industries such as: infrastructure and high-tech sectors have not only increased capital, but also improved their operational mechanisms. (http://www.sse.com.cn/sseportal/en/c01 /p996 /c1501 p996.shtml, accessed on 23 December 2012).

Entering the new century, about market construction and regulation, SSE was faced with great opportunities and had challenges to overcome. In Pudong, combining the cutting-edge hardware facilities, favorable policy conditions, exemplary role of Shanghai economy, SSE's goal was to have great confidence in making Shanghai into an international financial center.

1.2.2 Shenzhen Stock Exchange.

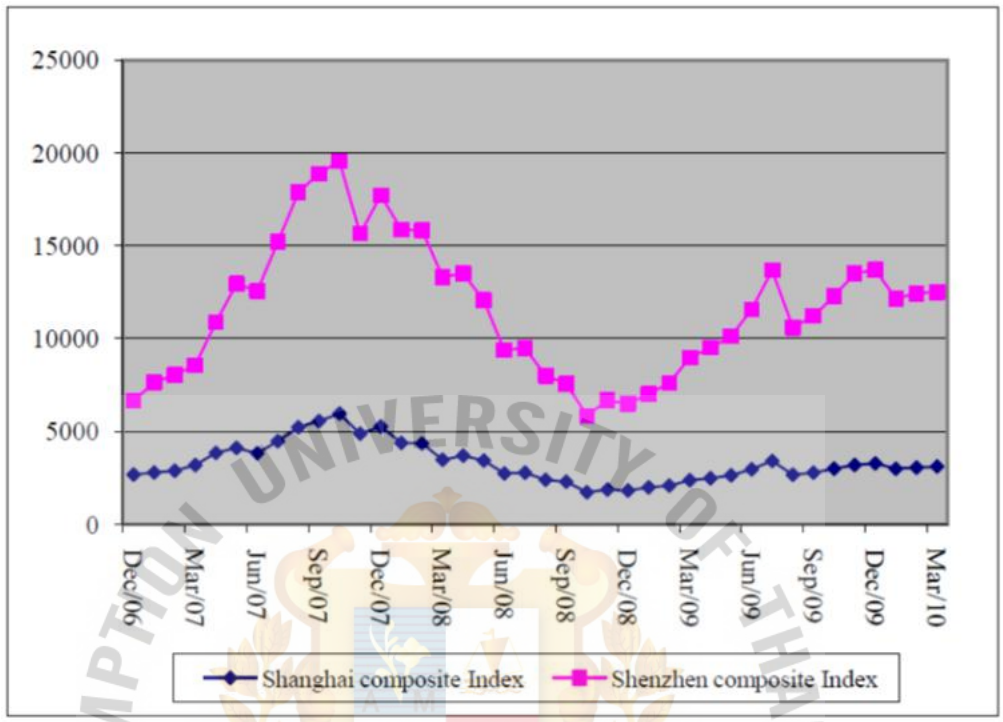
Shenzhen Stock Exchange (SZSE), founded on December 1st, 1990, is a self-regulated legal entity and provides the venue and facilities for centralized securities, as well as organizes and supervises securities trading. It also performs duties as prescribed under the supervision of China Securities Regulatory Commission (CSRC) and laws, regulations, rules and policies. Its main functions include securities trading, organizing and supervising securities trading, formulating operational rules, receiving listing applications and arranging securities listing, regulating listed companies, supervising members, managing and disseminating market information, and other functions were approved. (http://www.szse.cn/main/ en/AboutSZSE/SZSEOverview/, accessed on 23 December 2012).

SZSE has developed China's multi-tier capital market system which is very resolute. It serves national economic development and transformation, and supports the national strategy of independent innovation. In May 2004, the SME (Small and

Medium Enterprise) Board was launched. In January 2006, OTC (the non-listed shares quotation and transfer system) market is started in Zhongguancun Science Park. The ChiNext market was initiated in October 2009. Thus, the Multi-tier capital market in SZSE comprised of the Main Board, SME Board, ChiNext and the OTC market. Shenzhen Stock Exchange has attracted worldwide market attention. The total market capitalization amounted to RMB 6.6 trillion (USD 1.0 trillion). In addition, Zhongguancun Science Park had 102 companies quoted on the OTC market. SZSE in IPO proceeds was raised by RMB 181.0 billion (USD 28.7 billion) in the year 2011 and recorded a total trading value of RMB 18.4 trillion (USD 2.9 trillion). Equities, mutual funds, and bonds are also included in the SZSE's products. Main products of SZSE are A-shares, B-shares, indices, mutual funds (including ETFs and LOFs), and other products are diversified derivative financial products there are warrants and repurchases. The last one is fixed income products (including SME collective bonds and asset-backed securities). SZSE plays a growly important role in supporting the real economy and transforming the nation's economic growth model. (http://www.szse.cn/main/en/AboutSZSE /SZSEOverview/, accessed on 23 December 2012).

Since 2000, there were 28 major stock exchanges in the world which enhanced cross-border cooperation and communications. It has also taken an active part in international securities organizations. SZSE is a member in the World Federation of Exchanges (WFE) and the Asian and Oceania Stock Exchanges Federation (AOSEF). It is also an affiliate member of the International Organization of Securities Commissions (IOSCO). (http://www.szse.cn/main/en/AboutSZSE /SZSEOverview/, accessed on 23 December 2012).

Figure1.1 Shanghai Composite Index and Shenzhen Component Index, 2006-2010



Source: http://www.sse.com.cn/sseportal/ps/zhs/hqjt/hq2.jsp?code=000001.SS, accessed on 25 December 2012.

1.3 Statement of the Problems

Chinese stock markets are sensitive to government policies and in the pace of early development. Therefore, structural problems, institutional problems, immaturity of Chinese investor problems, and others have existed in Chinese Stock Market. For example, of some the listed companies published incomplete information and it was hard to find the data source.

In this study, the Capital Asset Pricing model has proved its usefulness. It provides an insight and view on market risks through the introduction of systematic risk. The most critical factor is that the model focuses only on the effects of the

systematic risk (Beta) associated with the cash flow from existing real assets. The model has not provided any mechanism to understand how the company's financial practice affects the market risk.

Although previous researchers have tried to determine the relationships between Beta and financial factors in the hospitality industry (Borde, 1998; Gu and Kim, 1998; Gu and Kim, 2002; Kim et al., 2002; Kim et al., 2007; Lee and Jang, 2007) and Gu and Kim (1998) investigated the casino industry using the data from 1992 through 1994. Their findings were quite different and the study results were mixed. There were still unclear conclusions about which specific financial variables were the determinants of systematic risk. Researchers were not sure if that information was still effective in all the industries of China.

This study focuses on eleven financial factors affecting the systematic risk of all the companies listed in Shenzhen stock market during 2009-2011. But in this study will separate data from three years. The research will especially seek answers to the following questions. Research questions are as follow:

1. Is there a significant relationship between firm size and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?
2. Is there a significant relationship between asset growth rate and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?
3. Is there a significant relationship between leverage (equity ratio) and systematic risk of all the companies listed in Shenzhen stock market (Beta) during year 2009?
4. Is there a significant relationship between liquidity (quick ratio) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?
5. Is there a significant relationship between profitability (return on asset) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

6. Is there a significant relationship between profitability (return on equity) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

7. Is there a significant relationship between operating efficiency (total assets turnover) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

8. Is there a significant association between asset liability ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

9. Is there a significant relationship between dividend payout and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

10. Is there a significant association between asset efficiency ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

11. Is there a significant relationship between asset coverage ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2009?

12. Is there a significant relationship between firm size and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

13. Is there a significant relationship between asset growth rate and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

14. Is there a significant relationship between leverage (equity ratio) and systematic risk of all the companies listed in Shenzhen stock market (Beta) during year 2010?

15. Is there a significant relationship between liquidity (quick ratio) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

16. Is there a significant relationship between profitability (return on asset) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

17. Is there a significant relationship between profitability (return on equity) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

18. Is there a significant relationship between operating efficiency (total assets turnover) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

19. Is there a significant association between asset liability ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

20. Is there a significant relationship between dividend payout and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

21. Is there a significant association between asset efficiency ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

22. Is there a significant relationship between asset coverage ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2010?

23. Is there a significant relationship between firm size and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

24. Is there a significant relationship between asset growth rate and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

25. Is there a significant relationship between leverage (equity ratio) and systematic risk of all the companies listed in Shenzhen stock market (Beta) during year 2011?

26. Is there a significant relationship between liquidity (quick ratio) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

27. Is there a significant relationship between profitability (return on asset) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

28. Is there a significant relationship between profitability (return on equity) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

29. Is there a significant relationship between operating efficiency (total assets turnover) and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

30. Is there a significant association between asset liability ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

31. Is there a significant relationship between dividend payout and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

32. Is there a significant association between asset efficiency ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

33. Is there a significant relationship between asset coverage ratio and systematic risk (Beta) of all the companies listed in Shenzhen stock market during year 2011?

1.4 Research Objectives

This study aims to explore the relationship between financial factors and systematic risk of all the listed companies in Shenzhen stock exchange in China during 2009-2011, three years separate and uses the results to help managers and investors more clearly understand the nature of risk in China. The main focus of this research is to test whether those financial factors have a significant relationship with systematic risk from the following objectives.

1. To test whether the firm size has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

2. To test whether asset growth rate has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

3. To test whether debt to leverage (debt to equity) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

4. To test whether liquidity (quick ratio) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

5. To test whether profitability (return on assets) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

6. To test whether profitability (return on equity) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

7. To test whether operating efficiency (total assets turnover) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

8. To test whether asset liability ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

9. To test whether dividend payout has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

10. To test whether asset efficiency ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

11. To test whether asset coverage ratios has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2009;

12. To test whether the firm size has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

13. To test whether asset growth rate has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

14. To test whether debt to leverage (debt to equity) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

15. To test whether liquidity (quick ratio) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

16. To test whether profitability (return on assets) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

17. To test whether profitability (return on equity) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

18. To test whether operating efficiency (total assets turnover) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

19. To test whether asset liability ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

20. To test whether dividend payout has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

21. To test whether asset efficiency ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

22. To test whether asset coverage ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2010;

23. To test whether the firm size has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

24. To test whether asset growth rate has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

25. To test whether debt to leverage (debt to equity) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

26. To test whether liquidity (quick ratio) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

27. To test whether profitability (return on assets) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

28. To test whether profitability (return on equity) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

29. To test whether operating efficiency (total assets turnover) has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

30. To test whether asset liability ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

31. To test whether dividend payout has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011;

32. To test whether asset efficiency ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011; and

33. To test whether asset coverage ratio has a significant relationship with systematic risk (Beta) of all the listed companies in Shenzhen Stock Market during year 2011.

1.5 Scope of the Research

The study scope covers only the companies that are listed in Shenzhen Stock Exchange of China. The population from all the listed companies 1503 firms, including to 22 different industries such as clothing, science and technology, medicine, commercial, chemical and plastics and so on. Data samples were selected based only on their availabilities and there are eleven variables including the firm's asset size, asset growth rate, leverage, liquidity, profitability, operating efficiency, assets liability ratio, dividend payout, asset efficiency ratio, asset coverage ratio. The study period was from 2009 to 2011.

This research uses yearly data, because the data on most of the selected variables are available in yearly time increments only from a total of 1503 firms in each year. However, due to incomplete data published in the Shenzhen stock exchange, different years have different observations: 811 observations in year 2009, 1103 observations in year 2010, and 1352 observations in year 2011. The research also only used systematic risk to represent the firm's performance, because these are widely used and accepted in several related researches. Selection of independent variables used in this research depends mainly on theoretical support and limitations on the availability of the data that could be retrieved from the valid sources, such as from Bloomberg Database.

1.5.1 Limitations of Research

The limitations come from two main sources as follows:

A Limitations from Data

This study only selected all the companies listed in the Shenzhen Stock Exchange Market in China from 2009 to 2011 as the research object. The other

industries listed on the Shanghai Stock Exchange Market were not included in this research and non-listed companies were also not included, because the financial information of the non-listed companies not published and it is very difficult to get full fiscal information. The research result may not be able to explain the conditions prior to the period from 2009 to 2011 or after if the economic structure has significantly changed. Yearly data are also used in the analysis. Therefore, the research results may be different when various frequency data (such as monthly or weekly) are used. This study only focuses on all of the industrial firms that were listed in the Shenzhen Stock Exchange of China from 2009 to 2011 and there were many firms each year that are excluded due to incomplete data and missing data. Therefore, the research results may not represent all the industries in China. Also, this research cannot be applied to other countries' markets.

This study only tests eleven financial ratios variable to systematic risk, due to items information published incompletely which were found in the financial statements in China's stock market. Other financial variables' data which cannot be found and the external economy factors which were not included must be considered as limitations in this study.

B. Limitations from Model

This research only uses the multiple regression and Capital Asset Pricing Model (CAPM) model. There have been limitations common to all studies which examine the issue to determinants of Beta in the framework of the capital asset pricing model which must be acknowledged. Other analysis models cannot be used. So, the results are different. To proxy the financial characteristics, financial statement accounting numbers must be used. The variety of accounting methods available to firms and the disparity between accounting income and values and economic income and values, therefore, cause any of these proxies to be suspected. In addition, the objective of the modeling and estimation is to examine risk, which is ex ante in

dimension, yet the estimation must be carried out on an ex post basis due to data measurement limitations.

1.6 Significance of the Study

This study can help operators, investors and researchers better understand the systematic risk and know which of the financial factors can impact the risk of stocks. It is will be essential for operators to enhance the company's value.

The findings of this study will academically contribute to the literature to Beta determinants by adding new factors from China and also may help clarify to the management that indeed such a policy is widely followed and may help it understand why it is so. They can realize how their business operational decision would affect not only the equity risk but also the credit risk. Consequently, both stockholders and creditors will realize the company' risk change and then derives the changing cost of capital as a whole. Therefore, management should be cautious over management of these types of risks. Corporate mangers then will sacrifice less of their time pondering about it.

Investigating the determinants of the risk of securities is beneficial in managerial decision making. Investors also benefit from understanding the determinants of market risk since the knowledge of these determinants may enable them to make improved forecasts of the risk associated with securities.

1.7 Definition of Terms

Asset Coverage Ratio represents the annual EBITDA divided by the average of the annual total assets for the same period. This ratio shows before the influence of taxes and leverage, company's total asset gains, profit power and is useful for comparing firms in the different tax situations and different degrees of financial leverage (Houston, 2001).

Asset Efficiency Ratio provides an indication of how returns could be earned in the cash flow while assets of a company are utilized. The cash operation reflects a company's ability, second measure method is total property, plant and equipment instead of total assets and to minus cash flows from operations based on its investment in operational assets (John, 1995).

Asset Liability Ratio is also called debt ratio. It is used to measure the firm leverage. The debt ratio is calculated by the total assets divided by the firm's liability. (Lawrence, 1997)

Beta is a measurement of volatility systematic risk, for stock or portfolio return (Jones, 1998).

Covariance represents two variables tend to covary, or move together. It is an absolute measure of the extent (Jones, 1998).

Debt to Equity (DE) is an indicator of financial leverage. The creditors and shareholders are assets, where one keeps more assets in the hand. It is determined by dividing long-term debt by common stockholder equity (Morgenson, 2002).

Dividend Payout provides an indication of how the firm is splitting its earnings between common stockholders and reinvesting them in the firm. It is calculated as

annual dividend payment dividend by net income (Pinches, 1991).

Growth Opportunities are opportunities to invest in profitable projects (Morgenson, 2002).

Leverage is use of debt financing. A firm uses assets and liabilities having fixed costs. A firm uses leverage in an attempt to earn returns in excess of the fixed costs of these assets and liabilities, thus increasing the return to common stockholders (Morgenson, 2002).

Liquidity is the ability of a firm to meet its cash obligations as they come due. If liquidity is high while the high ratio means that, a firm can meet short-term cash needs that might reduce risk (Myers, 1997).

Multiple Regression is the statistical measurement that is used to measure the behaviors of the dependent variable explained by several independent variables (Watsham, 1998).

Quick Ratio (QR) is also called the acid test ratio. Indicator of a company's financial power is strength or weakness. It is equal to current assets except that it excludes inventories, divided by current liabilities. This ratio shows information about the firm's liquidity and ability to meet its obligations. (Morgenson, 2002).

Return on Assets (ROA) is an indicator of profitability, measured by dividing net income for the past one year by total average asset. The result is shown is percentage. ROA also can be dissolution into return on sales (net income/sales) multiplied by asset utilization (sales/assets) (Morgenson, 2002).

Return on Equity (ROE) is quotient calculated by net income over stockholders' equity. A higher return on equity may increase a company's exposure to risk and

better for owners. (Kim, et al., 2007)

Risk is the chance of financial loss that the actual result from an investment gain or loss may differ from the expected outcome (James, 1995).

Systematic Risk is also called non diversifiable risk, is attributable to market factors as: war, inflation, international incidents, and political account for it and affect all companies, it cannot be eliminated through diversification. (Myers, 2005).

Unsystematic risk (diversifiable risk) is the risk of price change due to the unique circumstances of a specific security, as opposed to the overall market. This risk can virtually be eliminated from a portfolio through diversification, reduced exposure to risks by combining a variety of investments, such as stocks, bonds, and real estate. (Keown, 1996).

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1.8 Abbreviations

AER---Asset Efficiency Ratio

ALR---Asset Liabilities Ratio

AOSEF---Asian and Oceania Stock Exchanges Federation

ATR---Operating Efficiency (Asset turnover ratio)

CAPM ---Capital Asset Pricing Mode.

CSRC--- China Securities Regulatory Commission

DE---Leverage (Debt to Equity Ratio)

DIV---Dividend Payout

EBAS--- EBITDA/Total asset

Growth---Percentage of Total Asset

IOSCO ---International Organization of Securities Commissions

OTC market--- The Non-listed Shares Quotation and Transfer System

QR--- Liquidity (Quick ratio)

ROA---Return on Asset

ROE---Return on Equity

SME---Small and Medium Enterprise

SOEs---State-owned Enterprises

Size---Total Asset in Current Year

SSE---The Shanghai Stock Exchange

SZSE---The Shenzhen Stock Exchange

WFE--- World Federation of Exchanges

CHAPTER 2

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents and discusses both independent and dependent variables for this research. The independent variables are firm size, asset growth rate , leverage, liquidity, profitability, operating efficiency, asset liability ratio, dividend payout, asset coverage (earnings before interest, taxes, depreciation, and amortization/total asset), asset efficiency ratio (cash operating/ total asset). The dependent variable is systematic risk. The following section deals with those theories which come from literature reviews and show the relationships among the variables mentioned above as well as in previous studies.

2.1 Definition and Theories Related to Independent Variables(s)

2.1.1 Firm Size

Firm size is measured by the firm's current year total assets or percentage change in earning before tax. The large companies may have more assets, in this study more assets stand for bigger firm size. Sullivan, 1978; Gu and Kim, 2002 argued that large firms have the ability to lessen the effect of economic changes in large companies, because their firm's systematic risk is low. Titman and Wessels (1988) argue that big firms have more chance and power to resist risk, risk of bankruptcy lowers down and has more chance to reduce systematic risk. Olib (2008), contends that "all things being equal, large firms should have lower systematic risk due to economics of scale". Former researches have found a negative relationship with systematic risk (Logue and Merville, 1972; Breen Lerner, 1973; Gu and Kim, 2002).

2.1.2 Asset Growth Rate

A firm's growth condition can be measured directly by the growth rate of total assets. Large capital investment plans is a best growth strategy. Especially, long-term

investment, means the eventual effect of this capital spending and this generally translates into higher risk.

The growth rate in this study is the change in total assets in the given period, total assets of current year is subtracted by those of the previous year, and then dividend by the previous year. Annual percentage change in total assets was also used in Kim et al., (2002) as a growth measure. A fast growing firm might see more competition in the future and be more susceptible to economic fluctuations (Logue and Merville, 1972).

2.1.3 Leverage (Debt to equity)

This ratio is calculated by dividing debt by stockholder equity. There are two measure calculating methods standing for a firm's leverage. The first one is debt to equity (DE). The debt to equity ratio is varies according to the nature of the business or financial and the unstable of cash flows. Some researchers (Moyer and Chatfield, 1983; Kim et al., 2007) selected debt to equity ratio (DE). Investing in a high debt to equity ratio of a company could be risky particularly when interest rates are going up, because of the additional interest that has to be paid out for the liability. Debt to asset ratio (DA) is the second one; it is equal to the firm's total liability divided by total assets which is also commonly used. Gu and Kim (1998), Kim et al., (2002), and Lee and Jang (2007) used debt to assets ratio as a leverage measure. Equity ratio, on total equity to total assets, has also been used by some researchers (Borde, 1998; Gu and Kim, 2002). As seen above, there are many financial ratios that represent a firm's leverage. Among them, the researcher selected debt to equity (DE) as a variable. So, this study also chooses debt to equity to measure leverage.

2.1.4 Liquidity (Quick ratio)

The liquidity ratio is used to judge a firm's ability to meet short-term

obligations. It focuses on whether a firm has enough cash or assets readily convertible into cash to pay its current liabilities. If a firm has adequate cash, it should have no problem in paying its bills on time. If it has insufficient cash, a short-term crisis called insolvency occurs. Insolvency can be disastrous for a firm. Two ratios are calculated to measure liquidity: current and quick ratios. Gu and Kim (1998) used the current ratio (CL) as a liquidity determinant. The current ration measures the extent to assets closest to being cash to cover liabilities being payable. Therefore, a company is more liquid if the ratio is high which measures current ratio by current assets cover current liabilities.

Furthermore, the quick ratio (QR) is another measure of liquidity. The quick ratio is equal to the current ratio subtracted from its inventory, which is generally the least liquid current asset. Firms with the higher quick ratio are generally considered to have stronger financial capacity. Several hospitality researchers also used this measure (Gu and Kim, 1998; Gu and Kim, 2002; Kim et al., 2002; Kim et al, 2007). The quick ratio is used as a financial determinant of liquidity in this research.

2.1.5 Profitability (Return on Asset)

The return on assets (ROA) or called the return on investment (ROI), measures the firm's total effectiveness in generating profits with its available assets. Various financial ratios have been used to measure profitability. Return on Asset (ROA) is one of the widely used indicators as a profitability measure. Lee and Jang (2007) also used ROA as a measure of profitability. Some researchers (Kim et al., 2007) used return on investment (ROI). This study uses ROA as a profitability indicator.

2.1.6 Profitability (Return on Equity)

Three types can stand for profitability ratios: Profitability in relation to sales,

which is measured by gross profit margin, and ROA (Return on asset) and ROE (Return on equity) showing profitability in relation to investment. Return on equity is often used in comparing the profitability of two or more firms in an industry, and it also measures the return of owners' investment in the firm. Generally, the investors or owner prefer investing in the firms with high ROE. I can be calculated as net income divided by stockholders' equity. This study uses ROE as the second profitability indicator.

2.1.7 Operating Efficiency (Total asset turnover)

The studies of Gu and Kim (1998) and Gu and Kim (2002) used the asset turnover ratio as a measure of efficiency. This ratio is calculated from sales revenue divided by total assets. The asset turnover ratio indicates the efficiency of the firm to use its assets to generate sales. Generally, a high total asset turnover ratio, means it has already used more efficiently its assets. This measure indicates whether the firm's operations have been financially efficient, because it is probably of greatest interest to the management.

Asset turnover ratios relate sales to different types of assets to indicate how efficiently management is using assets to generate revenues. The purpose is to obtain an idea of the speed with which assets generate sales. The more rapidly assets are "turned over," the more efficient the use of assets are.

2.1.8 Asset Liability Ratio

Asset liability ratio is called debt ratio. The debt ratio is usually measured by the total assets or capital cover for the firm's long-term liability or debt. The higher this ratio, the higher the level of debt in the firm and its has better financial leverage (Lawrence and Abbott, 2001). Since long-term lease agreements also commit the firm to a series of fixed payment, it makes sense to include the value of lease obligations

with the long-term debt. Eugene and Houston (2007) defined that all current liabilities plus long-term debt equal to total debt. Stockholders and creditors have different view about high or low debt ratio. Lower debt ratio for creditors is better, because the greater the cushion against creditors' losses in the event of liquidation. But stockholders think more leverage can magnify expected earnings, thus the return stockholders. But too much debt often leads to financial difficulty, which eventually might cause bankruptcy.

2.1.9 Dividend Payout

The dividend payout ratio provides an indication of how the firm is splitting its earnings between common stockholders and reinvesting them in the firm. It is calculated as annual dividends payment dividend by net income (Pinches, 1991). Dividend payouts come to dividends generated on investment holdings when it usual options open to an investor. The dividend payout is the generated cash that a corporation issued to a shareholder as a dividend on the total number of shares. The dividend payout may involve all the net profits generated during the fiscal year, or be a portion of the net profit, but finally result must depending on the structure of the stock issue and company plans (Eugene and Houston, 2007), As an alternative to a dividend payout, shareholders may choose better plan as a dividend reinvestment. This option often allows the shareholder to save the dividend payment into a special account, it is used to buy additional shares of stock when they become available. Using reinvestment allows the investor to increase interest in the same period in the company. High-growth firms typically reinvest. Most of their earnings profit instead of paying dividend, resulting in low payout ratios. Slow-growth firms in stable industries typically pay out a much higher percentage of their earnings. Dividend payout ratios are an important part of the cash dividend policy decision (Eugene and Houston, 2007).

2.1.10 Asset Efficiency Ratio (Cash operating/ Total asset)

Asset Efficiency Ratio provides an indication of how returns could be earned in the cash flow while assets of a company are utilized. The cash operation reflects a company's ability; the second measurement method is total property, plant and equipment instead of total assets and to minus cash flows from operations based on its investment in operational assets. These measures, are tracked over a period of time and can better provide a view of the results when compared to other firms' in the same industry and can provide useful insights especially when the results are compared to other companies' in the same industry (John, 1995).

These ratios are calculated by dividing cash operation by the total asset, for department heads, production supervisors and segment managers, operating cash flows and total assets are important discussion topics that help them understand where the company is heading competitively. By heeding money coming in and exiting company vaults, senior management can take the overall pulse of operating activities, determining whether existing strategies are producing good results and changing them, if needed (Michael, 1995).

2.1.11 Asset Coverage Ratio (Earnings before Interest, Taxes, Depreciation, and Amortization/Total asset)

This value represents the annual EBITDA divided by the average of the annual total assets for the same period. This ratio shows the return of earnings on assets, but the earnings are before the influence of taxes, interest, depreciation and amortization. It is better for in same firm comparing in different conditions and help the management to adjust plans to get a better financial structure. (Houston, 2001).

2.2 Discussion of Dependent Variable

2.2.1 Systematic Risk

Systematic risk is the crucial determinant of an asset's expected return. We need some way to measure the level of systematic risk for different investments. The specific measure we will use is called the Beta coefficient (Ross and Jaffe, 1990), and un-diversifiable risk is market risks, also known as systematic risk. Market risk represents that component of total risk that is systematically dependent on the vagaries of the U.S economy. Then, Ramesh (1995) defined that unique risk is specific to a company. Such as the risk of obsolescence of technology and the risk of reduce revenues which are caused by increasing competition and the risk associated with patent approval, antitrust legislation, labor contracts, management styles and geographic locations all are examples of unique risk. Jordan (1996) showed that systematic risk is one that influences a large number of assets, each to a greater or lesser extent.

The influence of systematic risk is like inflation on a stock by using the Beta coefficient. The Beta coefficient (β), tells us the response of the stock price return and market return to the systematic risk. The covariance risk of a security i becomes the covariance between the return on security i and the return on the market portfolio. The covariance risk of a security i is represented as σ_{im}, where m is the market portfolio. If we further standardize this risk measure by the variance of the market returns, denoted σ_m^2 gets stock i's Beta coefficient (Donald and Thompson, 1994):

$$\text{Beta} = \frac{\sigma_{im}}{\sigma^2_{im}} \tag{2.1}$$

Where:

σ_{im} = covariance between the stock return and Shenzhen Stock Exchange

index return

σ_{im}^2 = the variance of the Shenzhen Stock Exchange index return

2.2.2 Capital Asset Pricing Model (CAPM)

In finance, Capital Asset Pricing Model (CAPM) has been widely used in asset pricing. When CAPM for the estimation of expected equity returns is employed, the regression Beta (coefficient) which represents the relative volatility of individual stock returns against market returns is taken as the measure for systematic risk

The original theoretical justification for beta as a measure of security risk is the capital asset pricing model as developed by Sharpe (1964). Under this formulation of asset pricing, the Beta factor is the sole security-specific variable determining differential risk premiums among securities. The "zero-beta" version of the capital asset pricing model drops the assumption of unrestricted borrowing and lending at a riskless rate but its conclusion regarding the role of Beta is essentially the same-namely, Beta is the sole security-specific factor determining differential expected return (i.e., risk premiums) among securities. Litzenberger and Ramaswamy (1979) have derived a three-parameter model of capital asset pricing, which includes systematic skewness as an additional determinant of differential expected returns. While recent empirical studies have raised questions regarding the predictive validity of the traditional version of the capital asset pricing model, they also provide evidence that Beta is an important explanatory variable with respect to differential ex post returns among securities and portfolios. Although there is considerable theoretical and empirical support for Beta as a risk measure, questions have been raised regarding whether it is the sole determinant of differential risk premiums among securities. In particular, Lintner and Douglas (1969) provide evidence from which they infer that unsystematic risk may also determine differential expected returns. While the work of Fama and MacBeth (1973) raise serious doubts about the validity of such inferences,

the issue is still an open one requiring additional research. It is sufficient for our purposes that Beta is at least one major determinant of security risk.

Sharpe (1964), Lintner (1965) and Mossin (1966) have extended the earlier work on portfolio models to capital asset pricing models (CAPM), which determine the equilibrium prices for all securities in the market. Essentially, the models start from the assumption that investors are generally risk averse and show that, in equilibrium, capital assets will be priced as;

$$E(R_i) = R_f(1-\beta_i) + \beta_i E(R_m) \tag{2.2}$$

Where:

$E(R_i)$ = Expected return of asset i.

R_f = Rate of return on a riskless asset.

$E(R_m)$ = Expected return on "market" portfolio.

The capital asset model states that the only variable which determines differential expected returns among securities is the risk coefficient β_i. The model further asserts that there is a linear relationship between market return and expected return and with it; the greater the risk, the higher the expected return.

Note that the variability of the individualistic component of return does not enter into the pricing of capital assets, since that component can be eliminated through diversification. Although the models were originally developed under the assumption of finite variance and co-variance, Fama (1970) has shown that the results extend to the broader class Stable distributions with finite expected values but infinite variances and covariance.

Empirical assessments of α_i and β_i can be obtained from a time series, least-squares regression of the following form:

$$R_{it} = \alpha_i + b_i R_{Mt} + e_{it} \quad (2.3)$$

Where:

R_{it} = The return on security i

R_{mt} = The return on the market index

α_i = The intercept term

b_i = The slope term

e_{it} = The random residual error

Where R_{it} and R_{Mt} ex post return for security i and the market, respectively, and where e_{it} is the disturbance term in the equation. The study of monthly security returns found that, on average, approximately 52 percent of the variation in an individual security's return could be explained by its combination with a market wide index of return. The percentage has been secularly declining since 1926, and, for the final 101 months of the study (ending with December, 1960), the proportion explained was 30 percent.

The assessment of β_i from a time series regression assumes that β_i was stationary during that period. Evidence by Ball and Brown (1969) suggests that stationary does exist, especially at the portfolio level. The empirical evidence Fama (1997) also indicates that the resulting equation conforms well to other assumptions of the linear regression model (i.e., linearity, serial independence of the disturbance terms and homoscedasticity), with one exception. The distribution of the estimated residuals is leptokurtic (i.e., has fatter tails than would be expected under normality). This departure from normality is consistent with Fama's (1996) findings that security

returns are members of the Stable family of distributions with finite means but infinite variances. However, For Stable distributions with finite expected values, least-square estimates of β_i are unbiased and consistent, although not efficient.

In sum, portfolio theory provides a measure of security riskiness that has both a priori and empirical support. Our knowledge of risk determination is incomplete in one important respect, as long as we do not know what exogenous data (i.e., non-price data) are impounded in the assessments of prices and price changes such as to give rise to a given value of β.

2.3 Relationship of Independent and Dependent Variables

2.3.1 Firm Size

Theoretically, the large firms will have a better ability to reduce all kinds of risk such as, impact of economic situations, society, and political change. So, big firms tend to have low systematic risk (Sullivan, 1978) or market strong power to achieve more profits in a more competitive environment (Ang et al., 1985; Moyer and Chatfield, 1983). Bettis (1981), and Grant and Jammine (1988) found out that firm size is one of the indicators of economy's scale and market power. The results show a relationship between size and profitability as large firms will have advantages over smaller firms due to economy of scale, as smaller firms cannot afford a large quantity of orders, which are reflected in a firm's performance. Other studies measure a firm's size by log of total employees. A number of empirical studies have found out that firm size can effect systematic risk, including those by Kim et al., (2002), Ang et al., (1985), Pate1 and Olsen (1984), Lev and Kunitzky (1974), Breen and Lerner (1973) and Micheal and Jensen (1969).

2.3.2 Asset Growth Rate

Borde (1998) found out that the growth rate was positively related to systematic risk and also showed that firms with high growth rate would keep getting bids from investors with the expectation of higher future earnings. The positive relationship is also supported by the research of Kim, Gu, and Mattila (2002). However, Alnajjar and Riahi-Belkaoui (2001) investigated manufacturing and service firms, and found a negative relationship between growth opportunities and systematic risk. In that way, the firms should be able to keep the prices of their stocks higher.

Beta is a weak function of growth (Hong and Sarkar, 2007). Systematic risks increase by rapid growth (Gu and Kim, 2002). According to Roh (2002), growth has an effect on systematic risk. High growth firms hope to gain more possessions or resources and if management wants to gets this, it needs extra financing.

2.3.3 Leverage (debt to equity)

In empirical studies, Mandelker and Rhee (1984) found a positive relationship between financial leverage and systematic risk. Hill and Stone (1980) research, a follow-up study of Mandelker and Rhee (1984) supported the positive relationship between them. Moreover, Ang, Peterson and Peterson (1985), Gu and Kim (2002), Kim et al., (2002), Kim et al., (2007), Lee and Jang (2007) and Melicher (1974) also found that financial leverage was positively related with systematic risk. Delcoure and Dickens (2004), Mandelker and Rhee (1984) addressed that financial leverage has a significant relationship with a firm's systematic risks regarding the direction of the relationship between them. Borde (1998) mentioned that leverage and systematic risk were generally believed to be related positively to risk.

Logue and Merville (1972) in the few firms use short-term liabilities as capital structure, they divide liabilities into two parts, short term liabilities and long term

liabilities. Olib et al., (2008) in their study found a positive relationship between leverage and systematic risk. Mnzava (2009) supposed the positive relationship among leverage and Beta.

2.3.4 Liquidity (Quick ratio)

The studies of Jensen (1984) and Kim et al. (2007) support the results of Borde's study (1998). Borde (1998) found a positive relationship between high liquidity and higher systematic risk. The researcher suggested that high liquidity might be associated with unwise use of available cash and short-term securities. However, there are still arguments about this finding. Since liquidity is the ability of a firm to meet its cash obligations as they be come due. Borde (1998) also mentioned that the firm's ability to collect necessary cash might lower the risk.

Jensen (1984) exposed a positive relationship among systematic risk and liquidity. He contended that both liquidity and agency cost of free cash flows of the firms also increases to systematic risk increase. According to prior studies, liquidity has different results which impact systematic risk. Most investors use liquidity ratios to forecast any firm's current position. Logue and Merville, (1972); Moyer and Charlfield, (1983); Gu and Kim, (1998, 2002); Lee and Jang (2006); Eldomiaty et al., (2009) found a negative relationship between systematic risk (Beta) and liquidity. It means when liquidity increases in the firm, the systematic risk decreases.

2.3.5 Profitability (Return on Asset)

These variables exist on two types of results based on systematic risk. First one from Scherrer and Mathison (1996); Gu and kim (2002); Lee and Jang (2006); Rowe and Kim (2010) show a negative relationship between profitability and systematic risk. However, in some other industries this relation goes inversed. Borde et al., (1994) a concluded positive relationship between profitability and systematic

risk in insurance companies, because in finance companies, when they take more credit risk it, leads towards more profit and the reason behind this is high risk and high profit. The key to success is profitability in any firm and in profitable firms the chances of systematic risk reduces (Logue and Merville 1972).

It is generally known that profitable firms are less risky. A firm with greater profitability can reduce the possibility of a firm's failure. Therefore, profitability is negatively related to systematic risks. Many researchers have found negative relationships between systematic risk and profitability, Logue and Merville (1972); Scherrer and Mathison (1996); Borde (1998); Kim et al (2007); Lee and Jang (2007).

2.3.6 Profitability (Return on Equity)

Melicher (1974) concluded that return on equity, a profitability measure, was positively related to systematic risk. Rowe and Kim (2010) indicated a positive relationship between return on equity and systematic risk.

2.3.7 Operating Efficiency (Total asset turnover)

The asset turnover ratio is used as an efficiency measure in the study. Asset turnover is calculated dividing total revenue by total assets for the period. This ratio is helpful to know the amount of sales that are made from each dollar of assets. Therefore, firms with low profit margins are likely to have high asset turnover and vice versa. Logue and Merville (1972) discovered that systematic risk was negatively related to assets efficiency.

Generally, researchers found out the negative impact of operating efficiency on systematic risk. Gu and Kim (1998, 2002) concluded the high operating efficiency and low systematic risk, means a negative related to each other. Eldomiaty et al., (2009) also found a negative factor relationship between them in nonfinancial sectors.

High operating efficiency means that systematic risk is reduced due to the generation more profit (Gu and Kim, 2002).

2.3.8 Asset Liability Ratio

Beaver et al (1970) found out that asset liability ratio is positively correlated with Beta. Logue and Merville (1972) also found a positive relationship in nonfinancial sectors between systematic risk and asset liability ratio. Rosenberg and McKibben (1973) and Pettit and Westerfield (1972) showed as positive association with systematic risk. On the other hand, the studies of Krugman (1979) failed to find any significant relationship between liquidity ratios and Beta. Gu and Kim (1998 and 2002) researchers show the positive sign on Beta,

2.3.9 Dividend Payout

High dividend can be reduced by agency cost (Ang et al., 1985). Most of investors focus on more certainty in flow of returns from dividends ,they are want to compared to the return from higher stock process (Logue and Merville, 1972). Former studies by Beaver et al. (1970), Breen and Lerven (1973), Bord (1998) have concluded a negative impact of dividend payout on systematic risks. Gu and Kim (2002) have declared an inverse relationship between systematic risk and dividend payout.

2.3.10 Asset Efficiency Ratio (Cash operating/ Total asset ratio)

Breen and Lerven (1973), Bord (1998) and Gu and Kim (2002) finding showed a negative relation in the banking sector. But (Borde, 1998; Amit and Livnat, 1988; Moyer and Chatfield, 1983) supported a negative sign in Non-financial sector indicating that the firms' asset efficiency ratio decreased as beta increased, these studies were in different sectors but had the same result.

2.3.11 Asset Coverage (Earnings before Interest, Taxes, Depreciation, and Amortization/Total asset ratios)

Many studies propose that EBITDA/Total asset to higher systematic risk (Kim et al, 2002; Borde, 1998; Amit and Livnat, 1988; Moyer and Chatfield, 1983). Empirical studies have unanimously supported a positive association between EBITDA/total asset and beta (Kim et al, 2002; Borde et al., 1994; Amit and Livanat, 1988; Mandelker and Rhee, 1984; Rosenberg and McKibeen, 1973; Beaver et al, 1970). Melicher (1974) findings showed that the beta and EBITDA/Total asset relationship might be positive.

2.4 Previous Studies

The systematic risk is the best renowned factor and measures the risk associated with financial decision. Estimated systematic risk is through Beta, because it beings about an association among firm decisions and stock market. So, Beta has an important role. In estimation of financial securities, the systematic risk is also a very important aspect, which has been discussed in eleven financial variables theories and also examined empirically in previous studies.

In the restaurant industry, Borde (1998) studied which financial characteristics affect a company's risk. He compared a firms' systemic risk (Beta) and total risk with liquidity, dividend payout ratio, leverage, return on assets as a profitability measure, and growth opportunities, using data from 1992 through 1995, by using panel data regression. According to his results, the level of liquidity and growth opportunity were positively related to systematic risk and total risk, while dividend payout ratio and return on assets were negatively related to those. In addition, the researcher concluded that the leverage ratio was almost irrelevant to risks. This is a very surprising result because leverage is generally believed to be related positively with

risk.

Gu and Kim (1998) using multiple regression analysis with OLS examined what affects casino firms' stocks and their systematic risk. Thirty-five U.S. casinos' financial data from 1992 to 1994 were used, and current ratio, leverage ratio, assets turnover ratio, and profit margin ratio were investigated as potential determinants of systematic risk. The ratios stood for liquidity, leverage, efficiency, and profitability. The results showed that only assets turnover, an efficiency measure, was negatively related to a firms' systematic risk and no relationship was found between the other variables and systematic risk. According to the results, efficient use of existing assets would help firms reduce systematic risk rather than new investments. However, the researchers could not find any relationships between systematic risk and the other variables except assets turnover. In other words, it might be hard to conclude that casino firms should concentrate on using existing assets as a risk reduction technique rather than expansion.

In the hospitality industry, financial ratio analysis has been one of the most popular methods to determine if the industry is risky. Thus, multiple studies of the relationships between risks and a few financial variables have already been conducted. In the hotel industry, Kim et al (2002) specifically examined the systematic risk of hotel real estate investment trust (REIT) companies with seven variables as relevant factors of systematic risk: leverage, growth, firm size, liquidity, efficiency, profitability, and dividend payout ratio by using a parametric statistic t-test to test the relationships. The samples were 19 publicly traded U.S. hotel REIT companies from1993 through 1999, which had a rapid growth period for them. They found out that leverage ratio and growth were positively related to systematic risk. Moreover, the firm size had a negative relationship with systematic risk in their study. Except for leverage ratio, growth rate, and firm size, Kim et al. (2002) could not find correlations between the other variables and systematic risk. They suggested that the firms need to decrease external financing while increasing internal financing to decrease the firms'

systematic risk. Moreover, growth by consolidation, merger, or acquisition was recommended as another technique to reduce companies' high systematic risk.

Next, there was a follow-up study of Borde's. Gu and Kim (2002) investigated which financial factors affect restaurant firms' systematic risks. The researchers used the same methodology as in Borde's study but with a larger sample size and a different period of 1996 through 1999. Moreover, asset turnover and total assets, representing efficiency and firm sizes, were included as additional financial variables. However, the researchers did not include total risk as a dependent variable because they determined that unsystematic risk was not a relevant factor considering CAPM theory. They only found out that a firms' systematic risk had a negative relationship with assets turnover, but had a positive relationship with quick ratio. Therefore, Gu and Kim's findings were not consistent with Borde's requires further studies in this area to reach a clear conclusion.

Kim et al (2007) continued to examine how financial ratios are correlated with systematic risk in the restaurant industry. They used multiple regression analysis with OLS. Interestingly, they divided the restaurant industry into two sectors: quick-service and full-service. The total sample size was 58, 25 quick-service restaurants and 33 full-service restaurants, and the financial variables were profitability, leverage, efficiency, liquidity, growth, and firm size. For the overall restaurant industry, they found a negative relationship between profitability and systematic risk, and leverage and liquidity were positively related to systematic risk. Even though profitability was also negatively related to systematic risk in both of quick-service and fullservice segments, leverage was not statistically significant in the full-service segment. However, leverage was still positively related to systematic risk in the quick-service segment. Although the results showed some different statistical relationships between the two segments, the researchers could not conclude if quick-service and full-service segments were significantly different because of the mixed results. The researchers also found some difficulties in dividing the restaurant industry into segments since

some firms in the sample could not be included in either one. The study of Kim et al. (2007) likewise does not show the same results with the previous two studies investigating the restaurant industry.

Lee and Jang (2007) investigated 16 U.S. airline companies from 1997 through 2002 to find out relationships between systematic risk and seven financial variables: liquidity, leverage, efficiency, profitability, firm size, growth, and safety. In the results, profitability, growth, and safety were negatively related to the systematic risk. However, leverage and firm size were positively related to systematic risk. The study proposed that airline companies should set up valuable financial strategies and lower operating costs to decrease the systematic risk.

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Table 2.1: Summary Table of Previous Related Studies

Author(s)	Year	Methodology	Finding
Borde	1998	He used the panel data regression to do an analysis based on the restaurant industry data from 1992 through 1995 to investigate the relationship between liquidity, dividend payout ratio, leverage, return on assets as a profitability measure, and growth opportunities	According to his results, the level of liquidity and growth opportunity were positively related to systematic risk and total risk, while dividend payout ratio and return on assets were negatively related to those. In addition, the researcher concluded that leverage ratio was almost irrelevant to risks
Gu and Kim	1998	A multiple regression analysis with OLS is used based on thirty-five U.S. casinos' financial data from 1992 to 1994, and current ratio, leverage ratio, assets turnover ratio, and profit margin ratio were investigated as potential determinants of systematic risk	The results showed that only assets turnover, an efficiency measure, was negatively related to firms' systematic risk and no relationship was found between the other variables and systematic risk

Kim et al.	2002	A parametric statistic t-test was used to measure leverage, growth, firm size, liquidity, efficiency, profitability, and dividend payout ratio toward systematic. The samples were 19 publicly traded U.S. hotel REIT companies from1993 through 1999	They found out that leverage ratio and growth were positively related to systematic risk. Moreover, firm size had a negative relationship with systematic risk in their study. Except for leverage ratio, growth rate, and firm size, Kim et al. (2002) could not find correlations between the other variables and systematic risk
Gu and Kim	2002	They used the panel data regression to do an analysis based on the restaurant industry data from 1996 through 1999, to investigate the relationships between liquidity, dividend payout ratio, leverage, return on assets as a profitability measure, asset turnover and total assets, representing efficiency and firm sizes and growth opportunities	They only found out that a firms' systematic risk had a negative relationship with assets turnover, but had a positive relationship with quick ratio

Kim et al.	2007	Using multiple regression analysis with OLS in the restaurant industry, they divided the restaurant industry into two sectors: quick-service and full-service. The total sample size was 58: 25 quick-service restaurants and 33 full-service restaurants, and the financial variables were profitability, leverage, efficiency, liquidity, growth, and firm size	For the overall restaurant industry, they found a negative relationship between profitability and systematic risk, and leverage and liquidity were positively related to systematic risk. Even though profitability was also negatively related to systematic risk in both quick-service and full -service segments, leverage was not statistically significant in the full-service segment. However, leverage was still positively related to systematic risk in the quick-service segment
Lee and Jang	2007	They investigated 16 U.S. airline companies from 1997 through 2002 to find out relationships between systematic risk and seven financial variables: liquidity, leverage, efficiency, profitability, firm size, growth, and safety	In the results, profitability, growth, and safety were negatively related to the systematic risk. However, leverage and firm size were positively related to the systematic risk

CHAPTER 3
RESEARCH FRAMEWORK

In this chapter, all of the frameworks of the research were used to identify each independent variable affecting the dependent variable. Chapter 3 consists of four parts. First of all, independent variables are used to develop the conceptual framework in this study. Then, the variables will show the conceptualization and definitions of each variable. The next section shows the research model of this research. The last section discusses the research hypotheses which show the relationships between the dependent variable and the independent variables.

To identify the determinants of systematic risk or Beta, previous studies focused on the relationship between Beta and quick ratio, debt ratio, operating efficiency, profitability, dividend payout, firm size, and asset growth rate. Most of the empirical studies used multiple regressions with Beta as the dependant variable and firm financial ratios as independent variables.

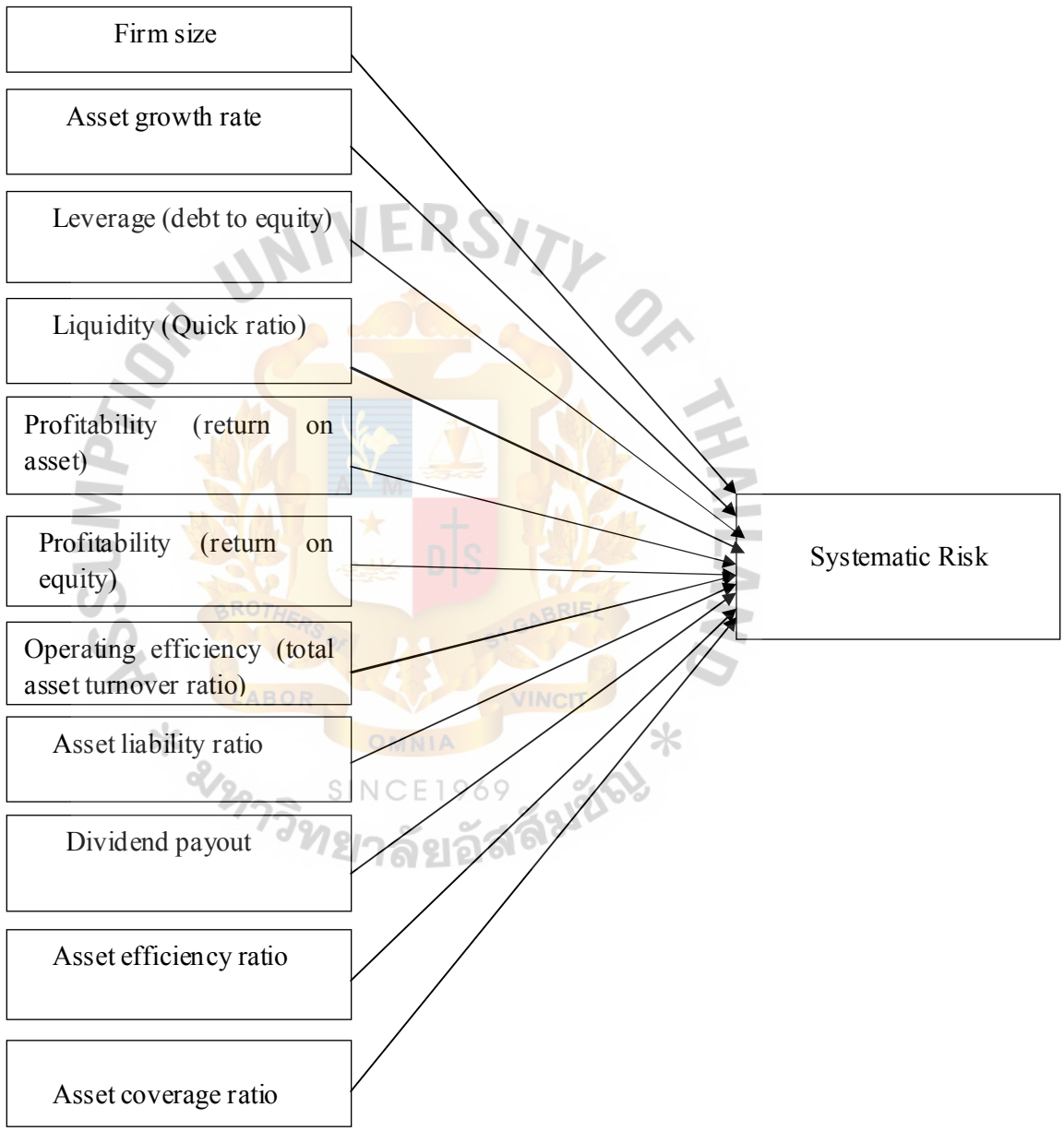
3.1 Conceptual Framework

The conceptual framework for this study focuses on investigating the relationship of financial factors with systematic risk. According to the results of the literature review in Chapter two, this study focuses only on the relationship between systematic risk and selected influential factors.

This study includes the dependent variables which are firm size, asset growth rate, leverage, liquidity, ROA, ROE, operating efficiency, asset liability ratio, dividend payout, asset efficiency ratio, and asset coverage ratio. Systematic risk is one of the independent variables.

The following diagram shows the conceptual framework used in this research study

Figure 3.1: Conceptual Framework



3.2 The Variables

In this research, eleven variables and one dependent variable will need their ratios to be calculated to determine if they have a significant relationship with systematic risk (Beta). Therefore, the sections to follow will detail the variables related to this research.

3.2.1 Systematic Risk

The systematic risk during a specific period could be estimated from the covariance between the stock return (R_i) and the Shenzhen index return (R_m), divided by the variance of the Shenzhen index return (R_m), as show equation. This research used the monthly stock and market index returns during a specific year to calculate the Betas. In this research, the last price of a fiscal year ending in December every year over the research period is used. Eugene and Houston (2003) defined the last price or the market price as the numerical value in which a stock sells in the stock market.

Bloomberg describes the last price (Bloomberg Mnemonic: PX_LAST) as the last price for the common stock provided by the exchange. For the Shenzhen stock exchange that trade from Monday to Friday, this field will be available only if such information has been provided by the stock exchange in the past 30 trading days.

$$\text{Beta}_i = \frac{Cov(R_i, R_m)}{Var(R_m)}$$

Where:

Var (R_M) = the variance of the portfolio

Cov (R_i,R_M) = the responsiveness of a stock's rate of return(R_i) to

changes in the market's return of return(R_M)

$Beta_i$ = an index of systematic risk in firm i

3.2.2 Firm Size ($Size_{it}$)

Bettis (1981), Grant and Jammine (1988) found out that firm size is one of the indicators of economy of scale and market power. The result shows a relationship between size and profitability. Large firms will have advantages over smaller ones due to economy of scale, as smaller firms cannot afford large quantity orders, which are reflected in a firm's performance. Other studies measure firm size by log of total employees.

Firm size = Total Asset in current year

3.2.3 Asset Growth rate ($Growth_{it}$)

Asset growth is a well known ratio for percentage change of asset value each year. This is to measure a firm's performance and mostly used to measure a firm's ability to exploit an opportunity in the product market. It can be calculated by

$$Growth_t = \frac{(\text{Current year's asset-Previous Year's asset})}{\text{Previous Year's asset}} * 100\%$$

3.2.4 Leverage (Debt to equity) (DE_{it})

Lasher (2000) indicated the amount of long-term debt in relation to the amount of shareholders' equity. A debt-equity value of less than 1.0 indicates shareholder investment in the firm is greater than that of long-term lenders. A value greater than 1.0 means the reverse. The debt-equity ratio is useful for measuring total liabilities

provided by the current ratio.

Lasher (2000) defined this ratio as a measure of the mix of debt and equity without the firm's total capital. It is an important measure of risk, because a high level of debt can burden the income statement with excessive interest.

$$\text{DE} = \frac{\text{Total Liabilities}}{\text{Total Equity}}$$

Bloomberg describes total liabilities and total equity (Bloomberg Mnemonic: BS_TOT_LIAB2, TOTAL_EQUITY) as the leverage of the company. Excel was used to calculate, using annual total liabilities dividend by annual total equity.

3.2.5 Liquidity (Quick ratio) (QR_{it})

To Levy (1998), if the firm cannot sell its inventory, its current assets will not be sufficient to cover its current liabilities. The term 'quick ratio' refers to the assumption that the assets can be quickly converted into cash. If its quick ratio is lower than 1 and if its inventory is "dead", a firm may be financially distressed and may have to sell some of its fixed assets (such as production machines, buildings, or land) to repay its current liabilities. Such a sale generally spells trouble. To prevent financial distress, the CFO must plan the firm's financing sources to keep the quick ratio higher than 1.

The least liquidity of a firm's current assets represents that inventories, hence they are the assets on which losses are most likely to occur in the event of liquidation. Therefore, inventories are important as a measure of the firm's ability to pay off short-term obligations without relying on the sale (Levy, 1998). This variable is calculated as follows:

$$QR = \frac{\text{Current Asset} - \text{Inventory}}{\text{Current Liabilities}}$$

Bloomberg describes current asset, inventory and current liabilities (Bloom Mnemonic: BS_CUR_ASSET, BS_INVENTORIES, BS_CUR_LIAB) as the trailing 12-month basic leverage from continuing operations.

3.2.6 Profitability (ROA) (ROA_{it})

Return on assets rely on net earn after tax and interest to stockholders and lenders on the total investment that they have in the firm. All the investors and lenders of a whole firm earned the rate of return. ROA measures total assets that have been invested to earn a profit and the overall ability of the firm to utilize the assets. As income is earned over the entire year, an average figure is appropriate (Lasher, 2002).

$$ROA = \frac{\text{Net Income}}{\text{Total Asset}}$$

Bloomberg describes net income (Bloomberg Mnemonic: NET_INCOME) as the ROA ratio of net income and total asset.

3.2.7 Profitability (ROE) (ROE_{it})

Return on equity shows the relationship of earnings available to common shareholders to the common shareholders' equity. ROE is a direct measure of the return from the common shareholders' perspective. In effect, ROE considers the potential advantage (or disadvantage) of financing a portion of the asset with borrowed funds. This ratio equals the net income available to common owners

divided by the common owners' equity. Management's target is to get the maximum return on owners' investment in the firm. Therefore, in fulfilling its goal, return on equity is the best single measure of the company's success. (Lawrence and Schall, 1991)

$$\text{ROE} = \frac{\text{Net Income}}{\text{Total Equity}}$$

3.2.8 Operational Efficiency (Total asset turnover) (ATR_{it})

This is to measure the relationship of revenue to total assets. This ratio is an indication of how effectively total assets utilized. A high turnover generally shows effective asset management, whereas a low one usually shows poor asset management. The total asset turnover reflects the efficiency of the management on investment in each of the individual asset items. The total asset turnover is a good summary measure of the efficiency of investment in all categories of assets. (Weston, 1992).

$$\text{ATR} = \frac{\text{Total Revenue}}{\text{Total Asset}}$$

Bloomberg describes total revenue (Bloomberg Mnemonic: SALES_ REV_ TURN). It is obtained by dividing the trailing 12-month total revenue disclosed on the income statement, by the ending for the period.

3.2.9 Asset Liabilities Ratio (ALR_{it})

It shows the firm's total liabilities in relation to its total assets. The ratio indicates the proportion of the firm's financial assets with borrowed funds. The higher this ratio, the more vulnerable creditors' positions if the firm must dispose of its assets in liquidation (Omet and Al-Debi, 2000). The total liabilities cover the total assets,

and is generally also called the debt ratio which, measures creditors provided by the percentage of total funds. Total liabilities combine are current liabilities and noncurrent liabilities. On side of the creditors, they are expected to have low debt ratio because lower ratios can decrease creditors' losses in the event of liquidation. On the other side of owners, option opposite outlook. They seek higher debt ratio, either to increase earnings or to give up some degree of control by selling new stocks. The debt to total assets ratio is also called the debt ratio. Generally, creditors prefer a low debt ratio since it implies a greater protection of their position. When debt ratio is high generally it means that the firm must pay more cash on its borrowing due to borrow more cash in the firm and interest payment increases; on the contrary, beyond a specific point, the firm will not be able to borrow at all.

$$\text{ALR} = \frac{\text{Total Liabilities}}{\text{Total Asset}}$$

3.2.10 Dividend Payout (DIV_{it})

High-growth firms typically reinvest most of their earnings instead of paying them out, resulting in low payout ratios. Slow-growth firms in stable industries typically pay out a much higher percentage of their earnings. Dividend payout ratios are an important part of the cash dividend policy decision (Eugene and Houston, 2007).

$$\text{DIV} = \frac{\text{Annual Dividend Payment}}{\text{Net Income}}$$

Bloomberg describes dividend payment (CF_DVD_PAID) as the ratio of annual dividend payment to net income. It is the trailing 12-month basic from continuing operations.

3.2.11 Asset Efficiency Ratio (AER_{it})

This ratio is calculated by dividing cash operations by total assets, for department heads, production supervisors and segment managers, operating cash flows and total assets are important discussion topics that help them understand where the company is heading competitively. By heeding money coming in and exiting company vaults, senior management can take the overall pulse of operating activities, determining whether existing strategies are producing good results and changing them, if needed (Michael, 1995).

$$\text{AER} = \frac{\text{Cash Operating}}{\text{Total Asset}}$$

Bloomberg describes cash operating (CF_CASH_FROM_OPER) as the ratio of the cash operation to the total asset. The cash operation is obtained from the company's t recent reporting period.

3.2.12 Asset Coverage Ratio ($EBAS_{it}$)

This value represents the annual EBITDA (Earnings before Interest, Taxes, Depreciation, and Amortization) divided by the average of the annual total assets for the same period. This ratio shows the utilization of the firm's assets which will able to show profit, but the profit before taxes influences leverage, therefore, it is useful to compare the different situations, such as: different tax rates and the degree of leverage. (Eugene & Houston, 2003).

$$\text{EBAS} = \frac{\text{EBITDA}}{\text{Total Asset}}$$

3.3 Research Model

Gujarati (2003) defined regression analysis as "the study of the dependence of one variable, the dependent variable, one or more other variables, the explanatory variables, with a view to estimating and /or predicting the (population) mean or average value of the former in terms of the know of fixed (in repeated sampling) value of later." To investigate the relationships between the variables and the significant determinants of the systematic risk, the most extensively used method to construct the regression model is the method of Ordinary Least Square (OLS). Chance (1982), Altman et al (1974) have used OLSQ to study the relationship between the systematic risk and its determinants. Brimble and Hodgson (2007) used Tobit regression model. As many researchers have preferred OLSQ model to measure the relationship between the systematic risk and the factors affecting systematic risk, the researcher will also use the OLSQ model to test the factors assessing the systematic risk using China's industries data.

The research model which captures all the independent variables are explained in the conceptual framework and has the following form.

$$\text{Systematic risk} = \alpha + \beta_{1t} Size_{it} + \beta_{2t} Growth_{it} + \beta_{3t} DE_{it} + \beta_{4t} QR_{it} + \beta_{5t} ROA_{it} + \beta_{6t} ROE_{it} + \beta_{7t} ATR_{it} + \beta_{8t} ALR_{it} + \beta_{9t} DIV_{it} + \beta_{10t} AER_{it} + \beta_{11t} EBAS_{it} + \varepsilon_{it} \quad (3.1)$$

Where:

i = firm i

t = year t

Systematic risk = systematic risk of the listed companies i in Shenzhen Stock Exchange

α = constant term or an intercept

$\beta_1 \ldots \beta_{11}$ = regression coefficients

ε = error term

Size = total asset in current year

Growth = asset growth rate

DE = leverage (Debt to Equity Ratio)

QR = liquidity (Quick ratio)

ATR = operating Efficiency (Asset turnover ratio)

ROA = return on asset

ROE = return on equity

DIV = dividend payout

AER = asset efficiency ratio

ALR = asset liabilities ratio

EBAS = EBITDA/total asset

The regression analysis was used, to calculate the values of the constant coefficient α and the slop coefficient β_1 and β_2 from the data that had already been collected from an amount of independent variables. Independent variables can be substituted into the regression to predict the dependent variables that would be generated. In calculating a regression equation, make the following assumptions:

1. Dependent and independent variables have a relationship and this relationship must be linear;

2. Data values of all dependent and independent variables have equal variances, also known as homoscedasticity;

3. The absence of correlation between two or among more independent variables, makes it difficult to determine the separate effect of individual variables; and

4. The data for the independent and dependent variables are normally distributed.

3.4 Research Hypotheses

In this research, there are thirty-three null hypotheses (H_{1o} to H_{33o}), and thirty-three alternative hypotheses (H_{1a} to H_{33a}) to assume whether the independent variables and dependent variable are significant to each other or not.

In choosing between the null hypothesis and alternative hypothesis the significance level is a critical probability. The level of significance determines the probability level of 0.05 and 0.1. If probability is less than 0.05 or 0.1, it will be considered to not support a null hypothesis. On the other hand, if probability is more than 0.05 or 0.1, the null hypothesis cannot the rejected to determine the relationship of financial factors on systematic risk as this study's objectives. The model for each financial factor has 11 hypotheses, so there are 33 hypotheses in this research.

The research hypotheses of this study are:

H_{1o} Firm size has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{1a}: Firm size has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{2o}: Asset growth rate has no significant effects on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{2a}: Asset growth rate has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009.

H_{3o}: Leverage (debt to equity ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{3a}: Leverage (debt to equity ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{4o}: Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{4a}: Liquidity (quick ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{5o}: Profitability (return on assets) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{5a}: Profitability (return on assets) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{6o}: Profitability (return on equity) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{6a}: Profitability (return on equity) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{7o}: Operating efficiency (total assets turnover ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{7a}: Operating efficiency (total assets turnover ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{8o}: Asset liability ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{8a}: Asset liability ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{9o}: Dividend payout has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{9a}: Dividend payout has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{10o}: Asset efficiency ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{10a}: Asset efficiency ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{11o}: Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{11a}: Asset coverage ratio (EBITDA/total asset) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{12o}: Firm size has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2009

H_{12a}: Firm size has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{13o}: Asset growth rate has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{13a}: Asset growth rate has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010.

H_{14o}: Leverage (debt to equity ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{14a}: Leverage (debt to equity ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{15o}: Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{15a}: Liquidity (quick ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{16o}: Profitability (return on assets) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{16a}: Profitability (return on assets) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{17o}: Profitability (return on equity) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{17a}: Profitability (return on equity) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{18o}: Operating efficiency (total assets turnover ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{18a}: Operating efficiency (total assets turnover ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{19o}: Asset liability ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{19a}: Asset liability ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{20o}: Dividend payout has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{20a}: Dividend payout has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{21o}: Asset efficiency ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{21a}: Asset efficiency ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{22o}: Asset coverage (EBITDA/total asset) ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{22a}: Asset coverage (EBITDA/total asset) ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2010

H_{23o}: Firm size has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{23a}: Firm size has the significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{24o}: Asset growth rate has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{24a}: Asset growth rate has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011.

H_{25o}: Leverage (debt to equity) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{25a}: Leverage (debt to equity ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{26o}: liquidity (quick ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{26a:}$ Liquidity (quick ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{27o:}$ Profitability (return on assets) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{27a:}$ Profitability (return on assets) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{28o:}$ Profitability (return on equity) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{28a:}$ Profitability (return on equity) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{29o:}$ Operating efficiency (total assets turnover ratio) has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{29a:}$ Operating efficiency (total assets turnover ratio) has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{30o:}$ Asset liability ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{30a:}$ Asset liability ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{31o:}$ Dividend payout has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

$H_{31a:}$ Dividend payout has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{32o}: Asset efficiency ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{32a}: Asset efficiency ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{33o}: Asset coverage (EBITDA/total asset) ratio has no significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

H_{33a}: Asset coverage (EBITDA/total asset) ratio has a significant effect on systematic risk (Beta) of the companies listed in Shenzhen stock market during year 2011

This shows how much the 11 factors influence systematic risk, in total there are 33 hypotheses being tested as mentioned above that will be shown in Chapter five.

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Table 3.1: Operationalization of Variables

Concept	Conceptual Definition	Operational Measurement
Firm size	Size of each firm measured by the firm's current year's total assets	Quantity
Asset Growth Rate	Asset growth is a well known ratio for percentage change of asset value each year.	Ratio
Leverage (Debt to equity)	The use of fixed costs in an attempt to increase (or lever up), measure by debt to equity	Ratio
Liquidity (Quick ratio)	The least liquidity of a firm's current assets represents its inventories, hence they are the assets on which losses are most likely to occur in the event of liquidation. The term 'quick ratio' refers to the assumption that the assets can be quickly converted into cash.	Ratio
Profitability (ROA)	Return on assets rely on net earnings after tax and interest to stockholders and lenders on the total investment that they have in the firm.	Ratio
Profitability (ROE)	Return on equity shows the relationship of earnings available to common shareholders to the common shareholders' equity. ROE is a direct measure of the return from the common shareholders' perspective.	Ratio

Operating Efficiency (Total asset turnover)	This is to measure the relationship of revenue to total assets. This ratio is an indication of how effectively total assets utilized. The total asset turnover is a good summary measure of the efficiency of investment in all categories of assets	Ratio
Asset liability ratio	It shows the firm's total liabilities in relation to its total assets. The ratio indicates the proportion of the firm's financial assets with borrowed funds.	Ratio
Dividend payout	The dividend payout is the generated cash that a corporation issued to a shareholder as a dividend on the total number of shares. Depending on the structure of the stock issue, the dividend payout may involve all the net profit generated during the fiscal year, or be a portion of the net profit	Ratio
Asset efficiency ratio	This ratio is calculated by dividing operating cash by total asset, for department heads, production supervisors and segment managers, operating cash flows and total assets are important discussion topics that help them understand where the company is heading competitively.	Ratio

Asset coverage ratio	This ratio shows the raw earning power of the firm's assets, before the influence of taxes and leverage, and it is useful for comparing firms with different tax situations and different degrees of financial leverage.	Ratio
Systematic Risk	Is attributable to market factors that affect all firms, and it cannot be eliminated through diversification.	Ratio

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CHAPTER 4

RESEARCH METHODOLOGY

The aim of this chapter is to provide an overview of the research methodology used for this study. This chapter is subdivided into five sections. The first section presents data collection and data sources. The second presents the Statistical treatment of data and multiple regressions in the research. The third section presents the research methods used. The fourth section presents the target population and sampling procedure, and the last one discusses the data analysis, and introduces a summary of statistical data treatment process in this study.

4.1 Data Collection and Data Source

This research is based on secondary data. Secondary data are those that are previously collected for some project other than the ones at hand (Zikmund, 2003). Secondary data are rapidly obtainable and less expensive than primary data. The data set for use in this study are from three years from annual financial reports on the 2009 through 2011 and includes the 1503 firms in Shenzhen stock market of China. Since some data could not be found or used directly from that annual report, the writer reorganized, arranged, and calculated the data to make them realistic in the analytical steps.

All sectors are defined by the Shenzhen stock market as agribusiness, banking, building and furnishing materials, chemicals components, energy, entertainment and recreation, financial and securities, food and beverage, health care, insurance, machinery and equipment, mining, packaging, pharmaceutical products and cosmetics, printing and publishing, professional services, property development, pulp and paper, textiles, clothing, transportation and others. Data used in the current study are available on Bloom Berg database (available in Assumption University library).

Bloomberg, a private firm was established in 1981. Bloomberg aims to keep the financial and business world operating by providing the highest possible quality data, news and analytics. This is done through Bloomberg's Professional service-----a massive database, streaming data within the unprecedented scope and in depth. The data stream is delivered to Bloomberg Professional service subscribers in real time on a Bloomberg Terminal. In addition to real time data, Bloomberg Professional also has a large database of historical financial data.

The previous studies have guided the research to exercise similarly in this research. In order to have a precise calculation, the researcher chooses to use monthly returns on stocks to calculate the beta. The monthly return usage to compute Beta is considered the optimal level required for data because it is not too little for the significance to be low and it is also not too frequent to lead to infrequent bias, where infrequently trading stocks data are missing.

4.1.1 Shenzhen Stock Exchange Index and Variable Data Collection

As Bloomberg indentifies companies by tickers, ticker symbols of all companies that existed in the Shenzhen stock exchange at the end of year 2011 were collected from a Bloomberg Terminal. Choosing the year 2011 formed the basis of all possible companies that existed right down to 2009. This was based on the assumption that there more companies which are set up than closed down as time passes by. Relevant data, if possible, were gathered for the last business day of each year from2009 to 2011.

Table4.1: Summary of Data Used in Research

Data	Time Period	Data Source
• Monthly Stock Price • Monthly Shenzhen Stock Exchange index • Annual total asset, total liabilities, net income, total revenue, total equity, cash operating, EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) listed on shenzhen stock exchange of 1503 companies.	31 December2009 to 31 December 2011	Bloomberg Professional Terminal

4.2 Statistical Treatment of Data

T-test will be conducted for all of the eleven independent variables subject to a 95% confidence level. T-statistics will test the significance of the slope, which is equivalent to test the significance of the correlation between dependent and independent variables. The relationship will be tested in a single multivariate regression model. If p value is less than a significant a level of 0.05 and 0.1, it means that independent variables can explain the dependent variable and there is a significant relationship between dependent and independent variables. On the other hand, if p value is more than a significant a level of 0.05 and 0.1, it means that the independent variable does not explain the dependent variable and there is no significant relationship between dependent and independent variables.

Since the data used in this research are separated to three years and each year is single, this study adopts the multiple linear regression model to analyze the relationship among the eleven factors which are a firm's characteristics (firm size and asset growth rate) and Financial resources (Leverage ratio and Asset Turnover) toward

a firm's performance which is systematic risk. The multiple linear regression model is a combination of the regular multiple linear regression model and the use of dummy variables. The estimation processes of this model are shown as follows:

4.2.1 Multiple Linear Regressions

Multiple Regression model contributes an important part for the succession of the test. Regression analysis provides solution to constructs and test a mathematical model of the relationship between a dependent variable (endogenous) and one or more independent (exogenous) variables. The model is the one associated with the lowest standard error and will give us better estimations.

The correlation of the additional independent variables to the dependent variable and the correlation(s) of the additional independent variables to the independent variables are already in the regression equation and both of them have the same importance to improve the prediction of the dependent variable related to the ability of an additional independent variable; collinearity is the association, measured as the correlation, between two independent variables.

A determination of the relative importance of each independent variable in the prediction of the dependent variable is measured by the most direct interpretation of the regression coefficient estimates. In all applications, the selection of independent variables should be based on their theoretical relationships to the dependent variable. In addition to assessing the importance of each variable, the multiple linear regression also affords the analyst a means of assessing the nature of the relationship between the predictors and the dependent variable. Finally, relationship among independent variables in their prediction of the dependent measure by multiple regression is provided.

There being k independent variables, we need to estimate $\hat{\beta}_0, \hat{\beta}_1, ..., \hat{\beta}_k$ from the following equation;

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + ... + \beta_k x_{ki} + u_i \tag{4.1}$$

Where, i represents that the number of entities (from 1 to n). This equation can be written in a matrix form as:

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} = \begin{bmatrix} \beta_0 + \beta_1 x_{11} + \beta_2 x_{21} + ... + \beta_k x_{k1} \\ \beta_0 + \beta_1 x_{12} + \beta_2 x_{22} + ... + \beta_k x_{k2} \\ \vdots \\ \beta_0 + \beta_1 x_{1n} + \beta_2 x_{2n} + ... + \beta_k x_{kn} \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_n \end{bmatrix} \tag{4.2}$$

And

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} = \begin{bmatrix} 1 & x_{11} & x_{21} & ... & x_{k1} \\ 1 & x_{12} & x_{22} & ... & x_{k2} \\ & & \vdots & & \\ 1 & x_{1n} & x_{2n} & ... & x_{kn} \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \beta_k \end{bmatrix} + \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_n \end{bmatrix} \tag{4.3}$$

The above matrix form can be written in a short form as:

$$\mathrm{Y} = \mathrm{X}\beta + \mathrm{u} \tag{4.4}$$

Where, **Y, X,** and **u** are the matrix with n rows; and β is a matrix with k+1 rows (including the constant term).

The Ordinary Least Squares method is the method used to calculate the value of $\hat{\beta}$ (referring to the estimated value of the real β) that minimizes the sum of squared

residuals (SSR) from the above multiple linear regression, where

$$\text{SSR}=\sum_{i=1}^{n} u_i^2 = \sum_{i=1}^{n} (y_i - \widehat{\beta}_0 - \widehat{\beta}_1 x_{1i} - \ldots - \widehat{\beta}_k x_{ki})^2. \quad (4.5)$$

and the set of $\widehat{\beta}s$,derived from the OLS method, which could minimize SSR can be calculated by using the matrix algebra, as follows:

$$\widehat{\beta} = \left[\mathrm{X}'\mathrm{X}\right]^{-1} \mathrm{X}'\mathrm{Y} \quad (4.6)$$

Where $\widehat{\beta}$ in the equation is a matrix with k+1 rows, which contains the value of all $\widehat{\beta}s$ (from $\widehat{\beta}_0$ to $\widehat{\beta}_k$).

The calculation procedures are divided into five main steps. It begins with the calculation of return on security and return on the market. Next, the standard deviation is computed. Subsequently, the estimate of Beta is obtained. The testing procedures are as follows:

1) Calculate the monthly returns of security, market as covariance and variance This is due to the stock price being published incompletely leading to missing data on Shenzhen Stock Exchange. So, some firms cannot have complete stock price from 2009 to 2011. Some firms only have stock price in 2011 or also incomplete data. The calculation of beta needs some kind of modification and only some months facing missing data were used to get Beta
2) Calculate the standard deviation of security and market return.
3) Calculate eleven financial ratios dependent on financial variables in the income statement, balance sheet and cash flow.
4) Test the eleven- factors relationship forward systematic risk (Beta) by

multiple regression.

5) Analytical results are gained.

4.2.2 Collection of Data

Ticker symbols of all companies that exist on the Shenzhen stock exchange were obtained from a Bloomberg Professional Terminal. With the ticker symbols, relevant data including ratio and variables of those companies were retrieved on the last trading day of all the years from 2009 to 2011. The data was retrieved and their descriptions are as follows:

- Asset efficiency ratio---This is measured by cash operating dividend by total assets. It is used to determine how well the assets of a company are utilized to generate a cash flow return.
- Company names---this is used to identify the representation of the collected ticker symbols.
- Debt ratio--- This is used to determine the leverage of the company; leverage is measured by calculating the total liabilities dividend by equity.
- Growth ratio--- This is the percentage of the total asset as the growth of a firm. It is used to determine if the company has more assets in following year than in previous years as growth.
- Last price---- This is the market price of the stock on the last trading day of the year. It is to calculate the return of the stock.
- Operating efficiency--- This is the total revenue dividend by total assets. It is used to determine if the company earned profits to pay out.
- Quick ratio---- This is used to determine the liquidity of the company; liquidity is measured by (current asset-inventory)/current liability.
- Return on asset (ROA)--- This is used to determine the profitability of the company. It is calculated by net income dividend by total assets.

- Return on equity (ROE)--- This is the net income divided by total equity. It is used to determine the earning power on shareholders' book investment.
- Shenzhen stock exchange index---This is used to determine the return of the stock index
- Total asset---This is used to determine the firm size.

4.3 Research Methods Used

This research study is based on causal research. Causal research indentifies the designed one to describe the factors which affect the systematic risk in China. The research problem has already been narrowly defined and conducted to identify cause-and-effect relationships among variable, it is called causal research (Zikmund, 2003).

In order for the researcher to carry out the research, data will be gathered from annual reports and financial statements published by each company listed on the Shenzhen Stock Exchange. The necessary ratios are calculated. Then, those ratios use statistical tools to get the results. The research is based on secondary data compiled from Bloomberg in the library of Assumption University: annual data for stock price, stock index, current year total assets, asset growth rate, debt to Equity Ratio, quick ratio, ROA, ROE, asset turnover ratio, assets Liability Ratio, dividend payout, asset efficiency ratio, asset coverage ratio covering the time period from 2009 through 2012.

4.4 Target Population and Sampling Produce

In this research, the target population consisted of 1503 firms listed on the Shenzhen stock market of China from 2009 to 2011. Three years were selected as the sample years for the following reasons. First, in 2009 China's economy was in recession

from the effects of global economic crisis in the year 2008, in the year 2009 it begin to restore until year 2011, from recession to restored period were included. Second reason for starting with 2009 number of listed companies were coming into Shenzhen Stock Exchange, total listed companies number reached 1503 firms and all the time keep it to the year 2011. Since three years are in the different economic situation and public data incomplete, missing data, also make observations different. Finally make a decision to analyze significant financial factors and systematic risks of each year, separate to three years, each year did not affect the results. This study incorporated data from financial statements of only 811 observations in 2009 years since stock price and financial variable records from all the firms could not be completed and in 2010 only 1103 observations could get data completed. In 2011 1352 observations could complete data. Over three years there were different firm numbers due to the fact that stock price had lots of missing data before 2011(on average, only 1326 companies' completed three-years data could be obtained). This writer used judgment sampling or purposive sampling to conduct the study. Judgment or purposive sampling is a non probability sampling technique in which an experienced individual selects the sampling based upon some appropriate characteristics of the sample members (Zigmund, 2003).

4.5 Data Analysis

This research covers the time period from 2009 to 2011. The analysis is conducted on all the industries on the Shenzhen Stock Exchange Market, for which three years' data are available. This study uses the program for calculation supporting the data analyses. The value of dependent and independent variables during 2009-2011 were input to run the program.

From the literature review, it can be seen that multiple regression model has been widely used to investigate the relationship between the variables and the significant determinants of the systematic risk. Therefore, multiple regression analysis will be used

in the research to test the hypothesis mentioned in Chapter three.

In this research Ordinal Least Square Regression (OLS), a technology designed to understand the relationship between the dependent variable (also called outcome variable) is used and the independent variables (also called predictor variables). All the statistical testing was done by the program. In this study, pooled data were used to run OLS regressions.

4.5.1 Systematic Risk (Beta) Computation

From the theoretical framework developed in the third chapter, the CAPM risk-return as described by the security market line (SML) equation is expected or the ex-ante relationship, while the Beta that it refers to is derived from the expected covariance and variances of the return. That is, the relationship is forward rather than backward looking and should embody investors' expectations. To test CAPM, one would like to have data on expected return and expected Beta value for the individual securities or the portfolio of securities. Expectations, however, are difficult to observe, especially with respect to the risk attributes of securities. Consequently, in using the CAPM equation as a way to find the beta, this present study relies on realized or historical data as inputs. The critical assumption here is that ex post returns and ex-post Betas will, on average, approximate investors' expectations regarding risk and return. The equation for the CAPM risk-return relationship is as follows:

$$R_i = R_f + (R_m - R_f)\beta_i + e_i \tag{4.7}$$

Where the risk-free rate (R_f) becomes analogous to the intercepted term and the market model (β_i) stands for the CAPM Beta. The term$(R_m - R_f)$ is defined as the market risk premium and the tern e_i is denoted as the error term. The excess return on

the market is expressed in the risk premium form $(R_m - R_f)$, whereas $(R_m - R_f)$ β_i is regarded as the risk premium for the individual stock. Thus, the term $(R_m - R_f)$ is common to all securities; the difference with respect to the risk on the individual stock must come from beta, β_i

So, the systematic risk (Beta) is measured by the formula as follows:

$$\text{Beta}_i = \frac{Cov(R_i, R_M)}{Var(R_M)} \tag{4.8}$$

Where:

Var (R_M)	=	the variance of the portfolio
Cov (R_i,R_M)	=	the responsiveness of a stock's rate of return(R_i) changes in the market's return of return(R_M)
Beta_i	=	Beta of firm i in index of systematic risk

Logue and Merville (1972) argued that the predicted true beta was liked to systematic risk (Beta) and due to the Beta rely on all matters which firms may be associated with, Beta had a suitable range of systematic risk, true Beta cannot be observed. A very important question was raised by Lee and Jang (2006) on the predicted Beta by historical returns which confirm if it cannot similar with true Beta or not. If the predicted Beta was stationary, so, the Beta obtained from time series data presented unbiased consequences only, (Breen and Lerner, 1973). Beta is calculated annually using monthly returns.

4.5.2 Monthly Return Estimation

There are two variables for the monthly returns that need to be understood. The first one is the monthly return of SZSE index, which is used as the benchmark for the return of the portfolio. The market rate of return is calculated by the change in the value of the SZSE index at the beginning of the month and the end of the month.

The formula is shown below:

$$R_{m,t} = \frac{(SZSE_t - SZSE_{t-1})}{SZSE_{t-1}} \tag{4.9}$$

Where:

$R_{m,t}$ = a return on the market at the end of the month;

$SZSE_{t-1}$ = SZSE index value in the previous period;

$SZSE_t$ = SZSE index value in the current period.

In addition, the second one is the monthly return of the security, which is calculated by the change in price of security at the beginning of the month and at the end of the month. The formula is shown below:

$$R_{i,t} = \frac{P_t - P_{t-1}}{P_{t-1}} \tag{4.10}$$

Where:

$R_{i,t}$ = a rate of return of stock i;

P_{t-1} = security price in the previous period;

P_t = security price in the current period.

4.5.3 Computation of Independent Variables

The calculation method of each financial variable according to the Standard and Bloom Berg database is listed below.

a). Firm Size = Current Year Total Assets

b). Growth $= \frac{\text{(Current year's asset-Previous Year's asset)}}{\text{Previous Year's asset}} * 100\%$

c). DE $= \frac{\text{Total Liabilities}}{\text{Total Equity}}$

d). QR $= \frac{\text{Current Asset} - \text{Inventory}}{\text{Current Liabilities}}$

e). ROA $= \frac{\text{Net Income}}{\text{Total Asset}}$

f). ROE $= \frac{\text{Net Income}}{\text{Total Equity}}$

g). ATR $= \frac{\text{Total Revenue}}{\text{Total Equity}}$

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h). ALR $= \dfrac{\text{Total Liabilities}}{\text{Total Asset}}$

i). DIV $= \dfrac{\text{Annual Dividend Payment}}{\text{Net Income}}$

j). AER $= \dfrac{\text{Cash Operating}}{\text{Total Asset}}$

k). EBAS $= \dfrac{\text{EBITDA}}{\text{Total Asset}}$

4.5.4 Statistical Significance of Result

The last stage of this research is to calculate the significance of the systematic risk. The t-test statistics was used. According to Myers (1997), a t-test is a statistical test for hypotheses. This is often used when the test statistics follows a student-t distribution. In this case, a two-tailed t-test was used. The systematic risk was tested for significance in order to draw a conclusion if there was enough evidence to reject or not to reject the hypothesis.

For a multiple linear regression model:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u \tag{4.11}$$

If we want to test a significant linear relationship between y and x_1, then we have to test a hypothesis which checks whether β_1 is equal to zero or not. Under a null hypothesis when β_1 is equal to zero (or no significant relationship between y

and x_1), the calculation of t-statistics for the two-tailed t-test is shown as follows:

$$\text{t-statistic} = \frac{\hat{\beta}_1 - 0}{SE(\hat{\beta}_1)}$$

Where $\hat{\beta}_1$ refers to the estimated regression coefficient of the real β_1; and $SE\hat{\beta}_1$ refers to the estimated standard error of $\hat{\beta}_1$ (or the square root of the estimated variance of the distribution of the $\hat{\beta}_1$).

The null hypothesis can be rejected, if an absolute value of t-statistics is greater than the critical value from the t-table at a level of required significance. Another easier and more popular way to approach the t-test is based on a measurement called the *p*-value (of the t-statistic). A *p*-value for a t-statistics represents the smallest level of significance at which we can reject the null hypothesis. (Kennedy, 1998)

In this case, we can reject the null hypothesis if the p-value is less than the level of significance (5% or 0.05 and 10% or 0.1 in general). If p-value is equal to or greater than the level of significance, the null hypothesis cannot be rejected.

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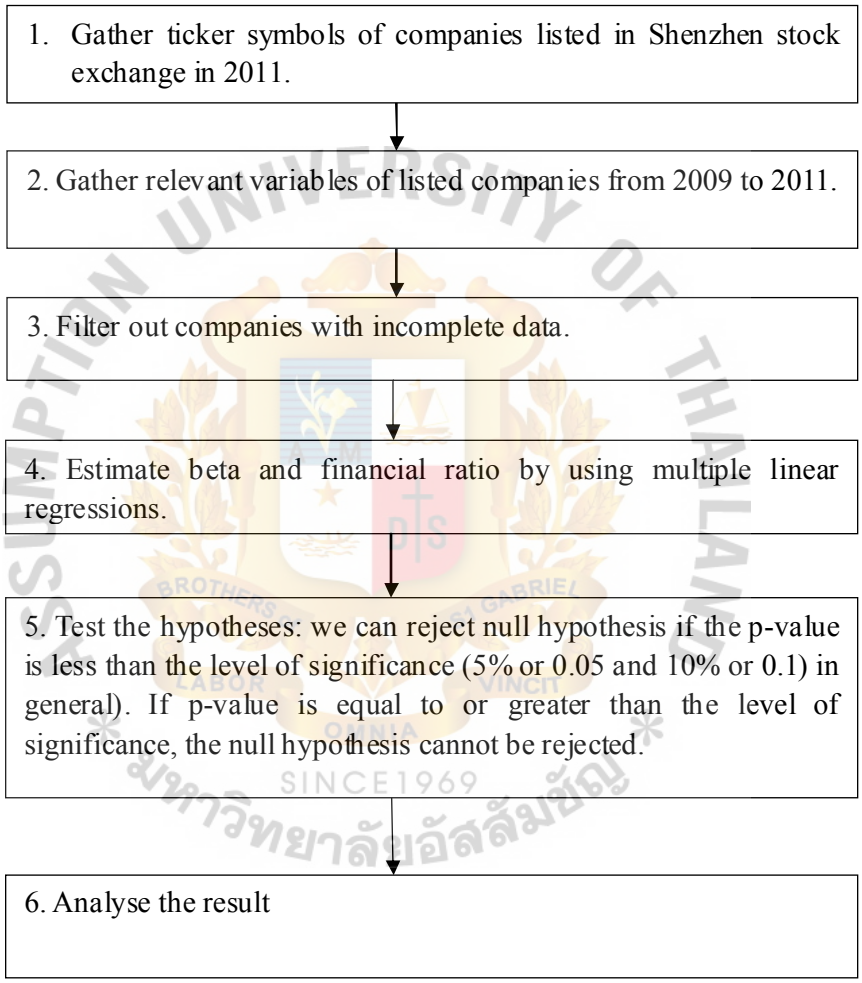
4.6 Summary of Statistical Data Treatment Process

The following is a summary of the statistical data treatment process

Figure4.1: Summary of Statistical Data Treatment Process



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CHAPTER 5

DATA ANALYSIS

In this chapter, the research analyzed the secondary data using a program and will present the empirical results of the research: data analysis and model analysis. This chapter focuses on the analysis of the secondary data on companies listed from the Stock Exchange of Shenzhen (SESZ) for the years from 2009 to 2011.

5.1 Descriptive Statistics

Data were obtained from 1503 firms in the Stock Exchange of Shenzhen. During 2009-2011, have different total observations, in 2009 year total there were 811 observations, in 2010 year total there were 1103 observations, in 2011 there were 1352 observations. The mean is an average of a set of data; different sets of data have their own values depending on the observations included in the category being assessed.

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Table 5.1 Statistics calculated for systematic risk (Beta), Asset efficiency ratio, Asset coverage ratio, Dividend payout ratio, Firm size, Asset growth rate. In the companies listed of Shenzhen stock market 2009.

	Systematic risk(Beta)	Asset efficiency ratio	Asset coverage ratio	Dividend payout ratio	Firm size	Asset growth rate
Mean	0.87450	0.058674	0.074651	0.281763	4790.176	0.393228
Median	0.821329	0.055120	0.071169	0.087882	1642.706	0.120004
Maximum	4.306478	0.710473	0.417454	20.15174	137608.6	24.14928
Minimum	-2.088127	-1.674317	-0.865485	-0.614020	23.25940	-0.777789
Std. Dev.	0.477277	0.110931	0.075284	0.945887	11346.89	1.309273
Skewness	0.339611	-4.382217	-2.704127	14.38803	6.913973	10.67288
Kurtosis	11.37932	77.54043	35.90138	270.7052	65.83429	162.9750
observations	811	811	811	811	811	811

The statistics for the companies listed of Stock Exchange of Shenzhen in 2009 year show that systematic risk (Beta) had a mean value of 0.8745, while asset efficiency showed a mean value at 0.058674. Asset coverage ratio had a positive mean value at 0.074651, dividend payout at 0.281763, and firm size at 4790.176, asset growth rate at 0.393228. The maximum value of systematic risk (Beta) had a positive value at 4.306478 and a minimum at -2.088127.Asset efficiency ratio, asset coverage ratio, dividend payout, firm size and asset growth rate show values for maximum and minimum at 0.710473 and -1.674317, 0.417454 and -0.865485, 20.15174 and -0.614020, 137608.6 and 23.25940, and 24.14928 and -0.777789.respectively.

Table 5.2 Statistics calculated for leverage, liquidity, return on asset, operating efficiency, return on equity, asset liabilities ratio in 2009

	Leverage (debt to equity)	Liquidity (quick ratio)	Return on asset	Operating efficiency	Return on equity	Asset liabilities ratio
Mean	0.946149	1.988432	0.037308	0.658976	0.064537	0.496263
Median	0.822530	0.943689	0.039000	0.556036	0.076773	0.461892
Maximum	16.58833	53.44986	0.884684	5.667223	7.477377	11.96673
Minimum	-108.9552	0.027214	-2.746270	-0.004038	-10.92546	0.014459
Std. Dev.	4.539104	3.878499	0.131162	0.534894	0.608737	0.561938
Skewness	-18.72888	7.250683	-11.74682	3.822894	-5.003546	13.75783
Kurtosis	436.1253	76.46108	258.3411	28.14114	185.4325	248.8601
observations	811	811	811	811	811	811

The second set of variables show the average leverage was 0.946149, the average liquidity was 1.988432, the average return on asset was 0.037308, the operating efficiency was 0.658976, return on equity was 0.064537 and asset liabilities was 0.495263. The leverage had a maximum of 16.58833 and a minimum of -108.9552, the liquidity had a maximum at 53.44986 and a minimum a t0.027214, the return on asset had maximum and minimum (0.884684 and -2.746270, respectively), operating efficiency had a maximum value at 5.667223 and a minimum value at -0.004038, the return on equity had a maximum value at 7.477377 and a minimum vale at -10.92546 and asset liabilities ratio had a maximum value at 11.96673 and a minimum value at 0.014459.

Table 5.3 Statistics calculated for systematic risk (Beta), Asset efficiency ratio, Asset coverage ratio, Dividend payout ratio, Firm size, Asset growth rate. In the companies listed at Shenzhen stock market in 2010.

	Systematic risk (Beta)	Asset efficiency ratio	Asset coverage ratio	Dividend payout ratio	Firm size	Asset growth rate
Mean	0.817925	0.028571	0.078213	0.199662	4992.479	0.730324
Median	0.867626	0.029174	0.076184	0.092882	1718.776	0.224136
Maximum	7.965210	0.942893	0.856553	3.909960	215637.6	63.55337
Minimum	-7.62287	-0.463548	-3.158255	-1.320000	0.949100	-0.513752
Std. Dev.	0.645144	0.094100	0.117115	0.340481	13577.23	2.564322
Skewness	-1.132570	0.799455	-18.89232	4.112247	9.251935	18.17467
Kurtosis	49.25557	14.47502	532.0538	32.06159	121.0777	405.3219
observations	1103	1103	1103	1103	1103	1103

The statistics for the companies listed of Stock Exchange of Shenzhen in 2010 year show that systematic risk (Beta) had a mean value of 0.817925, while asset efficiency showed a mean value at 0.028571. Asset coverage ratio had a positive mean value at 0.078213, dividend payout at 0.199662, and firm size at 4992.475, asset growth rate at 0.330324. The maximum value of systematic risk (Beta) had a positive value at 7.965210 and a minimum at-7.62287.Asset efficiency ratio, asset coverage ratio, dividend payout, firm size and asset growth rate show values for maximum and minimum at 0.942893 and -0.463548, 0.856553 and -3.158255, 3.909960 and 1.320000, 215637.6 and 0.949100, and 63.5533 and -0.513752.respectively.

Table 5.4 Statistics calculated for leverage, liquidity, return on asset, operating efficiency, return on equity, asset liabilities ratio in 2010

	Leverage (debt to equity)	Liquidity (quick ratio)	Return on asset	Operating efficiency	Return on equity	Asset liabilities ratio
Mean	0.784483	3.633875	0.040040	0.661264	0.079712	0.494300
Median	0.582903	1.257848	0.047201	0.545232	0.075981	0.379819
Maximum	21.64048	73.90896	2.637241	6.112713	7.541085	29.45399
Minimum	-105.4096	0.023558	-5.259407	-0.000641	-5.056481	0.012334
Std. Dev.	4.697144	7.011605	0.266960	0.533520	0.329551	1.468292
Skewness	-18.49205	4.780043	-15.13773	3.748457	5.204688	16.45384
Kurtosis	407.8554	32.16800	311.8466	28.28212	312.6337	299.8271
observations	1103	1103	1103	1103	1103	1103

The second set of variables shows the average leverage was 0.784483, the average liquidity was 3.633875, the average return on asset was 0.040040, the operating efficiency was 0.661264, return on equity was 0.079712 and asset liabilities was 0.494300. The leverage had a maximum of 21.64048 and a minimum of -105.4096, the liquidity had a maximum at 73.90896 and a minimum at 0.023558, the return on asset had maximum and minimum (2.637241 and -5.259407, respectively), operating efficiency had a maximum value at 6.112713 and a minimum value at -0.000641, the return on equity had a maximum value at 7.541085 and a minimum vale at -5.056481 and asset liabilities ratio had a maximum value at 29.45399 and a minimum value at 0.012334.

Table 5.5 Statistics calculated for systematic risk (Beta), Asset efficiency ratio, Asset coverage ratio, Dividend payout ratio, Firm size, Asset growth rate. In the companies listed at Shenzhen stock market 2011.

	Systematic risk(beta)	Asset efficiency ratio	Asset coverage ratio	Dividend payout ratio	Firm size	Asset growth rate
Mean	0.975975	0.012832	0.076504	0.222349	5110.745	0.358052
Median	0.984869	0.016598	0.073065	1.69E-06	1718.962	0.136255
Maximum	3.169368	0.849944	0.720838	21.30682	296208.4	6.041934
Minimum	-1.334042	-0.459705	-0.362152	-21.65088	6.683520	-0.617781
Std. Dev.	0.481151	0.086292	0.061150	1.033908	1.5534.92	0.655934
Skewness	-0.564342	0.457148	0.637685	2.033434	11.72920	3.464847
Kurtosis	5.741820	11.42506	16.83382	308.2601	193.9931	19.48702
observations	1352	1352	1352	1352	1352	1352

The statistics for the companies listed of Stock Exchange of Shenzhen in 2011 year show that systematic risk (Beta) had a mean value of 0.975975, while asset efficiency showed a mean value at 0.012832. Asset coverage ratio had a positive mean value at 0.076504, dividend payout at 0.222349, and firm size at 5110.745, asset growth rate at 0.358052. The maximum value of systematic risk (Beta) had a positive value at 3.169368 and a minimum at -1.334042. Asset efficiency ratio, asset coverage ratio, dividend payout, firm size and asset growth rate show values for maximum and minimum at 0.849944 and -0.459705, 0.720838 and -0.362152, 21.30682 and-21.65088, 296208.4 and 6.683520, and 6.041934 and -0.617781, respectively.

Table 5.6 Statistics calculated for leverage, liquidity, return on asset, operating efficiency, return on equity, asset liabilities ratio in 2011

	Leverage (debt to equity)	Liquidity (debt to equity)	Return on asset	Operating efficiency	Return on equity	Asset liabilities ratio
Mean	1.617581	3.841891	0.081036	0.661624	1.032253	0.397341
Median	0.504330	1.456095	0.048867	0.542126	0.073270	0.340249
Maximum	531.9383	179.5783	22.00513	7.514209	713.1976	13.39692
Minimum	-10.98845	0.034011	-0.404098	0.000374	-72.04211	0.007080
Std. Dev.	16.06745	8.547646	0.846603	0.562012	27.50477	0.582806
Skewness	29.01829	11.91469	25.77338	4.561133	25.69238	17.43909
Kurtosis	913.2719	215.7155	668.1816	40.25975	665.9042	377.0693
observations	1352	1352	1352	1352	1352	1352

The second set of variables shows the average leverage was 1.617581, the average liquidity was 3.841891, the average return on asset was 0.081036, the operating efficiency was 0.661624, return on equity was 1.32253 and asset liabilities was 0.397341. The leverage had a maximum of 531.9383 and a minimum of -10.98845, the liquidity had a maximum at 179.5783 and a minimum at 0.034011, the return on asset had maximum and minimum (22.00513 and -0.404098, respectively), operating efficiency had a maximum value at 7.514209 and a minimum value at -0.000374, the return on equity had a maximum value at 713.1976 and a minimum vale at -72.04211 and asset liabilities ratio had a maximum value at 13.39692 and a minimum value at 0.007080.

5.2 Correlation Matrix

From the three years correlation matrix in Table 5.7, 5.8, 5.9 it is clear there is no multicollinearity problem, because all correlation coefficients between independent variables are between -0.8 and 0.8. Therefore, there is no need to remove any independent variable from the regression equations.

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Table 5.7 Correlation Matrix in 2009

	BETA	AER	EBAS	DIV	SIZE	GROWTH	DE	QR	ROA	ATR	ROE	ALR
BETA	1	-0.018	-0.0889	0.01919	0.11028	-0.0728	0.01968	-0.093	-0.088	-0.0231	-0.0292	0.0478
AER	-0.01883	1	0.32876	0.01374	0.01309	-0.03032	-0.0516	0.078	0.10011	0.11112	-0.05046	-0.2998
EBAS	-0.08889	0.3287	1	0.02577	0.00801	0.07996	-0.0257	0.077	0.35505	0.22533	0.08723	-0.2659
DIV	0.01919	0.0137	0.02577	1	0.00193	-0.0278	0.01199	-0.003	0.01003	0.03756	0.00186	-0.0285
SIZE	0.11028	0.0130	0.00801	0.00193	1	0.02969	0.07416	-0.100	-0.0024	-0.0046	0.01814	0.06307
GROWTH	-0.0728	-0.030	0.079958	-0.0278	0.029694	1	0.02692	0.217	0.06960	-0.0655	0.02976	-0.0692
DE	0.01967	-0.05161	-0.02572	0.011992	0.074158	0.026924	1	-0.053	-0.0135	-0.0267	0.09688	-0.0077
QR	-0.0937	0.0781	0.07721	-0.00341	-0.10051	0.21758	-0.0536	1	0.11038	-0.1301	0.01594	-0.2331
ROA	-0.0879	0.1001	0.355054	0.01003	-0.00237	0.069606	-0.0135	0.110	1	0.06082	0.40323	-0.1618
ATR	-0.0230	0.1111	0.22533	0.03756	-0.00455	-0.06551	-0.0267	-0.130	0.06082	1	-0.0010	0.09672
ROE	-0.029	-0.05	0.0872	0.0019	0.0181	0.0298	0.0969	0.015	0.4032	-0.001	1	-0.014
ALR	0.04786	-0.299	-0.266	-0.0285	0.06307	-0.0693	-0.0077	-0.233	-0.1619	0.09672	-0.014	1

Table 5.8 Correlation Matrix in 2010

	BETA	AER	EBAS	DIV	SIZE	GROWTH	DE	QR	ROA	ATR	ROE	ALR
BETA	1	-0.0311	-0.0203	0.00994	0.07007	-0.0048	0.03	-0.097	0.002	0.011	-0.0043	0.0038
AER	-0.0311	1	0.02203	0.04328	-0.0334	-0.0015	-0.06	0.038	0.031	0.107	0.07827	0.0284
EBAS	-0.0203	0.02203	1	0.04768	0.0095	-0.0697	0.04736	0.027	0.484	0.132	0.17051	-0.3875
DIV	0.00994	0.04328	0.04768	1	-0.0464	-0.0270	-0.0136	0.090	0.038	0.009	0.01175	-0.0696
SIZE	0.07008	-0.0334	0.0095	-0.0464	1	0.02962	0.07977	-0.106	0.006	0.023	0.02253	0.0180
GROWTH	-0.0048	-0.0016	-0.0697	-0.027	0.02962	1	0.01426	0.202	-0.026	-0.072	0.03933	0.0160
DE	0.0334	-0.0647	0.0474	-0.0136	0.0798	0.0143	1	-0.058	0.006	0.058	0.2612	-0.0142
QR	-0.0976	0.03813	0.02765	0.09015	-0.1068	0.20278	-0.0581	1	0.054	-0.170	0.00229	-0.1202
ROA	0.00209	0.03157	0.48432	0.03831	0.00606	-0.0268	0.00659	0.054	1	0.098	0.27578	-0.8261
ATR	0.01118	0.10744	0.132401	0.00984	0.02395	-0.0729	0.05872	-0.170	0.098	1	0.11448	0.0299
ROE	-0.0044	0.07828	0.17051	0.01175	0.02253	0.03933	0.26117	0.002	0.275	0.114	1	0.0005
ALR	0.0039	0.0284	-0.3876	-0.0697	0.0181	0.016	-0.0142	-0.120	-0.826	0.029	0.0006	1

Table 5.9 Correlation Matrix in 2011

	BETA	AER	EBAS	DIV	SIZE	GROWTH	DE	QR	ROA	ATR	ROE	ALR
BETA	1	-0.0275	0.03115	-0.0540	-0.129	0.09742	0.02551	0.006464	-0.0885	-0.0048	-0.09033	-0.0444
AER	-0.0275	1	0.43998	-0.0267	0.00061	0.04864	-0.0438	0.060567	0.02522	0.10721	0.007102	-0.0423
EBAS	0.03115	0.43998	1	-0.0058	-0.0067	0.09649	-0.1156	0.01354	-0.0642	0.16398	-0.1039	-0.1495
DIV	-0.0540	-0.0267	-0.0058	1	-0.0161	-0.0438	-0.0135	0.206441	-0.0081	0.06539	-0.00752	-0.0377
SIZE	-0.1299	0.00061	-0.0067	-0.0161	1	-0.0461	0.00906	-0.08313	-0.0152	0.01241	-0.0114	0.09745
GROWTH	0.09742	0.04864	0.09649	-0.0438	-0.0462	1	-0.0408	0.17434	-0.0138	-0.1068	-0.0242	-0.131
DE	0.0255	-0.0439	-0.1156	-0.0136	0.0091	-0.0408	1	-0.0363	0.0604	-0.0176	-0.0054	0.0617
QR	0.00646	0.06056	0.01354	0.20644	-0.0831	0.17433	-0.0363	1	-0.0037	-0.0370	-0.01112	-0.1928
ROA	-0.0885	0.02522	-0.0643	-0.0082	-0.0153	-0.0138	0.06038	-0.0037	1	-0.0409	0.99583	0.035
ATR	-0.0048	0.10721	0.16397	0.06539	0.01240	-0.1067	-0.0175	-0.03708	-0.0409	1	-0.0428	0.22137
ROE	-0.0903	0.0071	-0.1039	-0.0075	-0.0114	-0.0242	-0.0054	-0.0111	0.99583	-0.0428	1	0.03378
ALR	-0.0445	-0.0423	-0.1496	-0.0378	0.0975	-0.131	0.0617	-0.1929	0.035	0.2214	0.0338	1

5.3 Results of Hypothesis Testing

In this section, regression analysis is used as a tool to identify the relationship between financial variables of firms in the Stock Exchange of Shenzhen towards systematic risk (Beta). The regression models from Chapter 3 are used again in this chapter.

Model:

$$\text{Systematic Risk} = \alpha + \beta_{1t} Size_{it} + \beta_{2t} Growth_{it} + \beta_{3t} DE_{it} + \beta_{4t} QR_{it} + \beta_{5t} ROA_{it} + \beta_{6t} ROE_{it} + \beta_{7t} ATR_{it} + \beta_{8t} ALR_{it} + \beta_{9t} DIV_{it} + \beta_{10t} AER_{it} + \beta_{11t} EBAS_{it} + \varepsilon_{it}$$

Hypothesis 1:

H_{1o} Firm size has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

H_{1a}: Firm size has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.10 The analysis of relationship between firm size and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Firm size	4.41E-06	1.48E-06	2.978783	0.003

The result of the hypothesis is shown in Table 5.11. The result from the p-value of the firm size equals 0.003, which is less than 0.05, the null hypothesis H_{o1} can be rejected at a 5% level of significance. The coefficient value equals 4.41E-06. This means that the firm size has a positive significant relationship with systematic risk.

Hypothesis 2:

$H_{2o:}$ Asset growth rate has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{2a:}$ Asset growth rate has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009.

Table 5.11 The analysis of relationship between asset growth rate and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset growth rate	-0.019657	0.013113	-1.499076	0.134

The result of the hypothesis is shown in Table 5.12. The result from the p-value of the asset growth rate equals 0.134, which is greater than 0.05, the null hypothesisH_{o2} cannot be rejected at a 5% level of significance. Although the coefficient value equals-0.019657, this also means that the asset growth rate does not have a significant relationship with systematic risk.

Hypothesis 3:

$H_{3o:}$ Leverage (debt to equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{3a:}$ Leverage (debt to equity) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.12 The analysis of relationship between debt to equity (leverage) and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Leverage (debt to equity)	0.00081	0.003705	0.21865	0.827

The result of the hypothesis is shown in Table 5.13. The result from the p-value of the debt to equity (leverage) equals 0.827, which is greater than 0.05, the null hypothesisH_{o3} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.00081, this also means that the debt to equity (leverage) does not have a significant relationship with systematic risk.

Hypothesis 4:

H_{4o}: Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

H_{4a}: Liquidity (quick ratio) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.13 The analysis of relationship between quick ratio (liquidity) and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Liquidity (quick ratio)	-0.00774	0.004571	-1.693298	0.091

The result of the hypothesis is shown in Table 5.14. The result from the p-value of the quick ratio (liquidity) equals 0.091, which is less than 0.1, and more than 0.05, so, null hypothesis cannot be rejected at a 5% level of significance. But the null hypothesis H_{o4} can be rejected at a 10% level of significance. The coefficient value equals -0.00774. This means that the quick ratio (liquidity) has a negative

significant relationship with systematic risk.

Hypothesis 5:

$H_{5o:}$ Profitability (return on asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{5a:}$ Profitability (return on asset) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.14 The analysis of relationship between return on asset and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Profitability (return on asset)	-0.198956	0.148948	-1.33574	0.182

The result of the hypothesis is shown in Table 5.15. The result from the p-value of the return on asset (profitability) equals 0.182, which is greater than 0.05, the null hypothesis H_{o5} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.198956, this also means that the return on asset (profitability) does not have a significant relationship with systematic risk.

Hypothesis 6:

$H_{6o:}$ Profitability (return on equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{6a:}$ Profitability (return on equity) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.15 The analysis of relationship between return on equity and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Profitability (return on equity)	-0.001089	0.030177	-0.036093	0.971

The result of the hypothesis is shown in Table 5.16. The result from the p-value of the return on equity (profitability) equals 0.971, which is greater than 0.05, the null hypothesisH_{o6} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.001089, this also means that the return on equity (profitability) does not have a significant relationship with systematic risk.

Hypothesis 7:

$H_{7o:}$ Operating Efficiency (total asset turnover) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{7a:}$ Operating Efficiency (total asset turnover) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.16 The analysis of relationship between total asset turnover and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Operating efficiency (total asset turnover)	-0.017677	0.032754	-0.539696	0.590

The result of the hypothesis is shown in Table 5.17. The result from the p-value of the total asset turnover (operating efficiency) equals 0.590, which is greater than 0.05, the null hypothesisH_{o7} cannot be rejected at a 5% level of significance.

Although the coefficient value equals -0.017677, this also means that the total asset turnover (operating efficiency) does not have a significant relationship with systematic risk.

Hypothesis 8:

$H_{8o:}$ Asset liability ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{8a:}$ Asset liability ratio has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.17 The analysis of relationship between asset liabilities ratio and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset liability ratio	0.003545	0.032837	0.107966	0.914

The result of the hypothesis is shown in Table 5.18. The result from the p-value of the asset liability ratio equals 0.914, which is greater than 0.05, the null hypothesisH_{o8} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.003545, this also means that the asset liabilities ratio does not have a significant relationship with systematic risk.

Hypothesis 9:

$H_{9o:}$ Dividend payout has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{9a:}$ Dividend payout has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.18 The analysis of relationship between dividend payout and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Dividend payout	0.010082	0.017595	0.573013	0.567

The result of the hypothesis is shown in Table 5.19. The result from the p-value of the dividend payout equals 0.567, which is greater than 0.05, the null hypothesis H_{o9} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.010082, this also means that the dividend payout does not have a significant relationship with systematic risk.

Hypothesis 10:

H_{10o}: Asset efficiency ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

H_{10a}: Asset efficiency ratio has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.19 The analysis of relationship between asset efficiency ratio and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset efficiency ratio	0.050153	0.164828	0.304277	0.761

The result of the hypothesis is shown in Table 5.20. The result from the p-value of the asset efficiency ratio equals 0.761, which is greater than 0.05, the null hypothesis H_{o10} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.0150153, this also means that the asset efficiency does not have a significant relationship with systematic risk.

Hypothesis 11:

$H_{11o:}$ Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

$H_{11a:}$ Asset coverage ratio (EBITDA/total asset) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009

Table 5.20 The analysis of relationship between asset coverage ratio and systematic risk in the year 2009

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset coverage ratio	-0.377871	0.258903	-1.459507	0.145

The result of the hypothesis is shown in Table 5.21. The result from the p-value of the asset coverage ratio equals 0.145, which is greater than 0.05, the null hypothesis H_{o11} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.377871, this also means that the asset coverage ratio does not have a significant relationship with systematic risk.

Hypothesis 12:

$H_{12o:}$ Firm size has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

H_{12a}: Firm size has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.21 The analysis of relationship between firm size and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Firm size	2.76E-06	1.44E-06	1.912188	0.056

The result of the hypothesis is shown in Table 5.22. The result from the p-value of the firm size equals 0.056, which is less than 0.1, and more than 0.05. So, cannot be rejected at a 5% of level of significance. But the null hypothesis H_{o12} can be rejected at a 10% level of significance. The coefficient value equals 2.76E-06. This means also that the firm size has a positive significant relationship with systematic risk.

Hypothesis 13:

$H_{13o:}$ Asset growth rate has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{13a:}$ Asset growth rate has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010.

Table 5.22 The analysis of relationship between asset growth rate and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset growth rate	0.002974	0.007774	0.382591	0.702

The result of the hypothesis is shown in Table 5.23. The result from the p-value of the asset growth rate equals 0.702, which is greater than 0.05, the null hypothesisH_{o13} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.002974, this also means that the asset growth rate does not have a significant relationship with systematic risk.

Hypothesis 14:

$H_{14o:}$ Leverage (debt to equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{14a:}$ Leverage (debt to equity) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.23 The analysis of relationship between debt to equity (leverage) and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Leverage (debt to equity)	0.003798	0.004381	0.866966	0.386

The result of the hypothesis is shown in Table 5.24. The result from the p-value of the debt to equity (leverage) equals 0.386, which is greater than 0.05, the null hypothesis H_{o14} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.003798, this also means that the debt to equity (leverage) does not have a significant relationship with systematic risk.

Hypothesis 15:

$H_{15o:}$ Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{15a:}$ Liquidity (quick ratio) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.24 The analysis of relationship between quick ratio (liquidity) and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Liquidity (quick ratio)	-0.008602	0.002925	-2.940949	0.003

The result of the hypothesis is shown in Table 5.25. The result from the p-value of the quick ratio (liquidity) equals 0.003, which is less than 0.05, the null hypothesis H_{o15} can be rejected at a 5% level of significance. The coefficient value equals -0.008602. This means that the quick ratio (liquidity) has a negative significant relationship with systematic risk.

Hypothesis 16:

H_{16o}: Profitability (return on asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

H_{16a}: Profitability (return on asset) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.25 The analysis of relationship between return on asset and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
profitability (return on asset)	0.087775	0.158511	0.55375	0.580

The result of the hypothesis is shown in Table 5.26. The result from the p-value of the return on asset (profitability) equals 0.580, which is greater than 0.05, the null hypothesisH_{o16} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.087775, this also means that the return on asset

(profitability) does not have a significant relationship with systematic risk.

Hypothesis 17:

$H_{17o:}$ Profitability (return on equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{17a:}$ Profitability (return on equity) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.26 The analysis of relationship between return on equity and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Profitability(return on equity)	-0.032011	0.071248	-0.449289	0.653

The result of the hypothesis is shown in Table 5.27. The result from the p-value of the return on equity (profitability) equals 0.653, which is greater than 0.05, the null hypothesis H_{o17} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.032011, this also means that the return on equity (profitability) does not have a significant relationship with systematic risk.

Hypothesis 18:

$H_{18o:}$ Operating Efficiency (total asset turnover) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{18a:}$ Operating Efficiency (total asset turnover) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.27 The analysis of relationship between total asset turnover and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Operating Efficiency (total asset turnover)	-0.003419	0.038142	-0.089648	0.929

The result of the hypothesis is shown in Table 5.28. The result from the p-value of the total asset turnover (operating efficiency) equals 0.929, which is greater than 0.05, the null hypothesis H_{o18} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.003419, this also means that the total asset turnover (operating efficiency) does not have a significant relationship with systematic risk.

Hypothesis 19:

$H_{19o:}$ Asset liability ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{19a:}$ Asset liability ratio has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.28 The analysis of relationship between asset liabilities ratio and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset liability ratio	0.005752	0.026897	0.213855	0.831

The result of the hypothesis is shown in Table 5.29. The result from the p-value of the asset liability ratio equals 0.831, which is greater than 0.05, the null hypothesis H_{o19} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.005752, this also means that the asset liabilities ratio does

not have a significant relationship with systematic risk.

Hypothesis 20:

$H_{20o:}$ Dividend payout has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{20a:}$ Dividend payout has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.29 The analysis of relationship between dividend payout and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Dividend payout	0.045343	0.057489	0.788724	0.430

The result of the hypothesis is shown in Table 5.30. The result from the p-value of the dividend payout equals 0.430, which is greater than 0.05, the null hypothesis H_{o20} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.045343, this also means that the dividend payout does not have a significant relationship with systematic risk.

Hypothesis 21:

$H_{21o:}$ Asset efficiency ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{21a:}$ Asset efficiency ratio has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.30 The analysis of relationship between asset efficiency ratio and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset efficiency ratio	-0.165983	0.209243	-0.793255	0.428

The result of the hypothesis is shown in Table 5.31. The result from the p-value of the asset efficiency ratio equals 0.428, which is greater than 0.05, the null hypothesis H_{o21} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.165983, this also means that the asset efficiency does not have a significant relationship with systematic risk.

Hypothesis 22:

$H_{22o:}$ Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

$H_{22a:}$ Asset coverage ratio (EBITDA/total asset) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010

Table 5.31 The analysis of relationship between asset coverage ratio and systematic risk in the year 2010

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset coverage ratio	-0.158602	0.190805	-0.831227	0.406

The result of the hypothesis is shown in Table 5.32. The result from the p-value of the asset coverage ratio equals0.406, which is greater than 0.05, the null hypothesis H_{o22} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.158602, this also means that the asset coverage ratio does not have a significant relationship with systematic risk.

Hypothesis 23:

$H_{23o:}$ Firm size has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

H_{23a}: Firm size has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.32 The analysis of relationship between firm size and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Firm size	-4.10E-06	8.38E-07	-4.896456	0.000

The result of the hypothesis is shown in Table 5.33. The result from the p-value of the firm size equals 0.000, which is less than 0.05, the null hypothesis H_{o23} can be rejected at a 5% level of significance. The coefficient value equals -4.10E-06. This means that the firm size has a negative significant relationship with systematic risk.

Hypothesis24:

$H_{24o:}$ Asset growth rate has no significant effects on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{24a:}$ Asset growth rate has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011.

Table 5.33 The analysis of relationship between asset growth rate and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset growth rate	0.072593	0.020577	3.5278	0.000

The result of the hypothesis is shown in Table 5.34. The result from the p-value of the asset growth rate equals 0.000, which is less than 0.05, the null hypothesis H_{o24} can be rejected at a 5% level of significance. Although the coefficient value equals 0.072593, this means that the asset growth rate has a positive significant relationship with systematic risk.

Hypothesis 25:

$H_{25o:}$ Leverage (debt to equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{25a:}$ Leverage (debt to equity) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.34 The analysis of relationship between debt to equity (leverage) and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Leverage (debt to equity)	0.004306	0.001668	2.580669	0.010

The result of the hypothesis is shown in Table 5.35. The result from the p-value of the debt to equity (leverage) equals 0.010, which is less than 0.05, the null hypothesis H_{o25} can be rejected at a 5% level of significance. The coefficient value equals 0.004306, this means that the debt to equity (leverage) has a positive significant relationship with systematic risk.

Hypothesis 26:

$H_{26o:}$ Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{26a:}$ Liquidity (quick ratio) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.35 The analysis of relationship between quick ratio and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Liquidity (quick ratio)	0.000265	0.001635	0.162281	0.871

The result of the hypothesis is shown in Table 5.36. The result from the p-value of the quick ratio (liquidity) equals 0.871, which is less than 0.05, the null hypothesis H_{o26} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.000265. This means also that the quick ratio (liquidity) has no significant relationship with systematic risk.

Hypothesis 27:

$H_{27o:}$ Profitability (return on asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{27a:}$ Profitability (return on asset) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.36 The analysis of relationship between return on asset and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Profitability (return on asset)	-0.889326	0.387796	-2.293287	0.022

The result of the hypothesis is shown in Table 5.37. The result from the p-value of the return on asset (profitability) equals 0.022, which is less than 0.05, the null hypothesis H_{o27} can be rejected at a 5% level of significance. The coefficient value equals -0.889326, this means that the return on asset (profitability) does have a negative significant relationship with systematic risk.

Hypothesis 28:

$H_{28o:}$ Profitability (return on equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{28a:}$ Profitability (return on equity) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.37 The analysis of relationship between return on equity and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Profitability (return on equity)	0.025895	0.01195	2.166927	0.030

The result of the hypothesis is shown in Table 5.38. The result from the p-value of the return on equity (profitability) equals 0.030, which is less than 0.05, the null hypothesis H_{o28} can be rejected at a 5% level of significance. The coefficient value equals 0.025895, this means that the return on equity (profitability) does have a positive significant relationship with systematic risk.

Hypothesis 29:

$H_{29o:}$ Operating Efficiency (total asset turnover) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{29a:}$ Operating Efficiency (total asset turnover) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.38 The analysis of relationship between total asset turnover and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Operating Efficiency (total asset turnover)	0.002078	0.024399	0.085185	0.932

The result of the hypothesis is shown in Table 5.39. The result from the p-value of the total asset turnover (operating efficiency) equals 0.932, which is greater than 0.05, the null hypothesisH_{o29} cannot be rejected at a 5% level of significance. Although the coefficient value equals 0.002078, this also means that the total asset turnover (operating efficiency) does not have a significant relationship with systematic risk.

Hypothesis30:

$H_{30o:}$ Asset liability ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{30a:}$ Asset liability ratio has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.39 The analysis of relationship between asset liability ratio and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset liability ratio	-0.008329	0.024118	-0.345358	0.730

The result of the hypothesis is shown in Table 5.40. The result from the p-value of the asset liability ratio equals 0.730, which is greater than 0.05, the null hypothesis H_{o30} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.008329, this also means that the asset liabilities ratio does not have a significant relationship with systematic risk.

Hypothesis 31:

$H_{31o:}$ Dividend payout has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{31a:}$ Dividend payout has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.40 The analysis of relationship between dividend payout and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Dividend payout	-0.024983	0.012798	-1.952033	0.051

The result of the hypothesis is shown in Table 5.41. The result from the p-value of the dividend payout equals 0.051, which is less than 0.1, and more than 0.05. So, the null hypothesis cannot be rejected at a 5% of significance. But the null hypothesis H_{o31} can be rejected at a 10% level of significance. The coefficient value equals -0.024983, this also means that the dividend payout has a negative significant

relationship with systematic risk.

Hypothesis 32:

$H_{32o:}$ Asset efficiency ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{32a:}$ Asset efficiency ratio has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.41 The analysis of relationship between asset efficiency ratio and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset efficiency ratio	-0.264533	0.166916	-1.58479	0.113

The result of the hypothesis is shown in Table 5.42. The result from the p-value of the asset efficiency ratio equals 0.113, which is greater than 0.05, the null hypothesis H_{o32} cannot be rejected at a 5% level of significance. Although the coefficient value equals -0.264533, this also means that the asset efficiency does not have a significant relationship with systematic risk.

Hypothesis 33:

$H_{33o:}$ Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

$H_{33a:}$ Asset coverage ratio (EBITDA/total asset) has a significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011

Table 5.42 The analysis of relationship between asset coverage ratio and systematic risk in the year 2011

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Asset coverage ratio	0.859128	0.360707	2.381788	0.017

The result of the hypothesis is shown in Table 5.43. The result from the p-value of the asset coverage ratio equals 0.017, which is less than 0.05, the null hypothesis H_{o33} can be rejected at a 5% level of significance. The coefficient value equals 0.859128, this means that the asset coverage ratio does have a positive significant relationship with systematic risk.

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CHAPTER 6

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

The purpose of this chapter is to provide a summary of the findings, as well as conclusion and recommendations. The first part shows the summary of findings, which refers to the results mentioned in Chapter 5. The conclusion and discussion are provided in this chapter, with the recommendations included in the last part of this chapter.

6.1 Summary of Findings

This study examines the relationships between financial factors and systematic risk companies listed from the Stock Exchange of China. There are 1503 listed companies who provided yearly data from 2009 to 2011. In total, in the year 2009, 2010 and 2011, there were 811, 1103 and 1352 observations in this sample data set. The summaries of findings are shown as: Table 6.1 shows the summary of hypothesis results with regard to systematic risk (Beta) in the year 2009. Table 6.2 offers the summary of hypothesis results with regard to systematic risk (Beta) in the year 2010.Table 6.3 shows the summary of hypothesis results with regard to systematic risk (Beta) in the year 2011.

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Table 6.1 Summary of Hypothesis result systematic risk (Beta) in the year 2009.

Number	Null hypothesis(H_0)	Coefficient	Prob.	Result
1	Firm size has no the significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	4.41E-06	0.003	Reject H_0
2	Asset growth rate has no significant effects on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	-0.019657	0.1342	Failed to reject H_o
3	Leverage (debt to equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	0.00081	0.827	Failed to reject H_o
4	Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	-0.00774	0.091	Reject H_o
5	Profitability (return on asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009.	-0.198956	0.182	Failed to reject H_o

6	Profitability (return on equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	-0.001089	0.971	Failed to reject H_o
7	Operating Efficiency (total asset turnover) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	-0.017677	0.590	Failed to reject H_o
8	Asset liability ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	0.003545	0.914	Failed to reject H_o
9	Dividend payout has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	0.010082	0.567	Failed to reject H_o
10	Asset efficiency ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	0.050153	0.761	Failed to reject H_o
11	Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2009	-0.377871	0.145	Failed to reject H_o

Table 6.2 Summary of Hypothesis result systematic risk (Beta) in the year 2010.

Number	Null hypothesis(H_0)	Coefficient	Prob.	Result
1	Firm size has no the significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	2.76E-06	0.056	Reject H_o
2	Asset growth rate has no significant effects on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	0.002974	0.702	Failed to reject H_o
3	Leverage (debt to equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	0.003798	0.386	Failed to reject H_o
4	Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	-0.008602	0.003	Reject H_o
5	Profitability (return on asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	0.087775	0.580	Failed to reject H_o

6	Profitability (return on equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	-0.032011	0.653	Failed to reject H_o
7	Operating Efficiency (total asset turnover) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	-0.003419	0.929	Failed to reject H_o
8	Asset liability ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	0.005752	0.831	Failed to reject H_o
9	Dividend payout has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	0.045343	0.430	Failed to reject H_o
10	Asset efficiency ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	-0.165983	0.428	Failed to reject H_o
11	Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2010	-0.158602	0.406	Failed to reject H_o

Table 6.3 Summary of Hypothesis result systematic risk (Beta) in the year 2011.

Number	Null hypothesis(H_0)	Coefficient	Prob.	Result
1	Firm size has no the significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	-4.10E-06	0.000	Reject H_o
2	Asset growth rate has no significant effects on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	0.072593	0.000	Reject H_o
3	Leverage (debt to equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	0.004306	0.010	Reject H_o
4	Liquidity (quick ratio) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	0.000265	0.871	Failed to reject H_o
5	Profitability (return on asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	-0.889326	0.022	Reject H_o

6	Profitability (return on equity) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	0.025895	0.030	Reject H_o
7	Operating Efficiency (total asset turnover) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	0.002078	0.932	Failed to reject H_o
8	Asset liability ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	-0.008329	0.730	Failed to reject H_o
9	Dividend payout has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	-0.024983	0.051	Reject H_o
10	Asset efficiency ratio has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	-0.264533	0.113	Failed to reject H_o
11	Asset coverage ratio (EBITDA/total asset) has no significant effect on systematic risk (Beta) of companies listed in Shenzhen stock market during year 2011	0.859128	0.017	Reject H_o

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In this case, the null hypothesis is rejected if the p-value is less than the level of significance (5% or 0.05 and 10% or 0.1 in general). If the p-value is greater than or equal to the level of significance, the null hypothesis cannot be rejected. This research uses the software package to test all of the stated hypotheses. In the year 2009 results show two influential factors for which the null hypothesis are rejected. There is the firm size and liquidity (quick ratio). In the year 2010 results show only the results for liquidity and firm size cause the null hypothesis to be rejected. In the 2011 year, result shows seven influential factors for which the null hypothesis are rejected. There are the firm size, asset growth rate, leverage (debt to equity), profitability (return on asset) and (return on equity), dividend payout and asset coverage ratio, which have significant relationships with systematic risk.

6.2 Discussion and Conclusion

From 2009 to 2011, for three years the economic situation was not good following a slow down in China, special in the year 2009. Then, 2010, was better than in 2009, but still caused trouble, such as prices increased, because of inflation. The economy was better in the end of the 2011. Even though, it still faces questions, but key economic indicators show signs that the economy is recovering.

US subprime crisis of the year 2008, affected the following year, everything was not restored in the year 2009, economic growth continued downward, currency was under pressure problems and credit growth from different kinds of firms took place in the year 2010, foreign trade environment had worsened, inflation continued to become a serious worry, but there were also positive factors: the global economy had recovered step by step and inflation level was not high in the world, domestic development environment was conducive to economic growth.

Based on three years from 2009 to 2011, the subprime crisis and special economic policy have heavily affected the Shenzhen Stock Exchange in China. China is a developing country and on the way to development, based on national conditions

to create applicable strategies or policies to develop business; so the market economy in China was not feasible, specially the economic situation in China. And in the three years have missing data. So, the data may affect the test results; financial factors of the same eleven variables, respectively, from 2009 to 2011, each year showed different results.

The conclusion and discussions are discussed by individual factors as shown below. The results from each variable were calculated using the program, which may or may not use the same assumptions as this study.

The results show that firm size has a significant positive effect on systematic risk in the year 2009 and 2010. It means assets of firm size are big and systematic risk is high. This may be because after the subprime crisis in the year 2008, China's economy was also heavily affected, in order to restore the economy and increase of infrastructure to raise the level of domestic consumption which can push the industry, to expand its business and assets as Listed companies have more resources available to support the needs of the business; the year 2011 firm size had a significantly negative effect on systematic risk. Lee and Jang (2007) found that there was a significant negative relationship between firm size and systematic risk. This study's findings were not consistent with Lee and Jang (2007). This is because in recent years, the price rise was fast, exports declined as each firm had a heavy impact; managements were trying to save power, could only transfer their investment into domestic market, such as in remote and rural areas, this area had slow economic development, demand was big for kinds of products. This strategy can help the firm to reduce loss, for the future.

The results showed that asset growth rate has no relationship with systematic risk in the year 2009 and 2010, in contradiction to the initial expectation. At first, it was expected that the asset growth rate may affect systematic risk because the higher asset growth rate would show a higher risk. In this research, the assets growth rate has a

close relationship with assets. The global subprime crisis still hasn't disappeared and most firms are still in the slow recovery and have slow growth, assets impact on systematic risk was weakened during 2009 and 2010. But in the year 2011 there was asset growth rate a significant positive relationship with systematic risk. It is means high asset growth rate have high systematic risk. This result was consistent with Borde (1998) who found that there was a positive relationship between asset growth rate and systematic risk. In China also explored different ways to curb soaring prices, such as: providing subsidies make goods or labor cost reduction, allow businesses to lower production costs, while the global economy is slow its recovery.

When the debt to equity is higher, the systematic risk of firms in the Shenzhen stock market was high, in the year 2011. In the current year the government mentioned that increasing the money supply, lowering interest rates, reducing the financing cost, increasing credit channels, will make to firms have confidence by increasing loans to expand the development path, create more profits and value for enterprise, it also will be to improve the level of the shareholders' equity in the two or three years. It is debt to equity has a significant positive relationship with systematic risk only on the year 2011, This result is similar to the conclusion of Lee and Jang (2007), Kim et al.,(2007) as the debt to equity is closely positive associated with the systematic risk, but during the years 2009 and 2010, there was debt to equity no relationship with systematic risk. Still the influence of the economic environment, the number of firms cannot borrow loan from the banks. Firm development was restricted, burden of surplus and profits were not enough as operating fees, daily spending, that there was also no more spare money to satisfy shareholders' equity.

While the liquidity (quick ratio) in China does not have a relationship with systematic risk on 2011, but the year 2009 and 2010 quick ratio had a significant negative relationship with systematic risk, it is mean high quick ratio have low systematic risk. This study's finding were not consistent with Bored (1998), Gu and Kim (2002) and Kim er al., (2007) found out there was a positive related to systematic

risk, it was as expected that higher quick ratios are associated with lower systematic risks of firms in this study. This may be because under the influence of the global economy. China's exports substantially reduced, rising labor costs, exchange rate appreciation, advantages of low labor cost had become impossible in China. The domestic market could not instantly absorb all kinds of products, leading to each firm's inventory backlog, the liquidity of assets and liabilities were also slowing down. Although it has improvements and domestic markets consume parts of inventory in 2010, enables the enterprise to have breathing space, but after all, the economic environment brings great pressure to each firm; domestic markets cannot solve all the inventories and troubles of each firm, just only reduce a little pressure for firms.

The return on asset was expected to have a relationship with systematic risk. However, the results reported otherwise: the return on asset has no relationship with systematic risks which could be attributed to the relatively high fixed assets that are common. In the year 2009 and 2010, it cannot easily adjust its assets structure in the short run, thus as the firms' earning decreases, the return on assets will also decrease. The decreased return on assets of the firm may not increase the investors' perceived risk because if the firm needs to liquidate. Its high fixed assets will cover their investment. In recent years, almost all firms' operating conditions were not good from the influence of the subprime crisis of the year 2008 and its spread was inevitable, but the domestic economic situation is not optimistic in China, commodities prices have been rising, as well as rising costs of various products; shortage of raw materials, have resulted in a decrease of corporate profits which are shrinking. Some companies have even consecutive losses, until its closure. The year 2011 had a significant negative relationship between the return on asset and systematic risk. Bored (1998) also found out the same result, negatively related to Beta; in 2011, the economy, cased as the Chinese government issued some remedial measures, increased security measures to improve people's living subsidies, created more jobs opportunity for people, and adjusted the structure of the production chain. As far as possible to reduce the production cost, make the enterprises have profit so that consumers can also buy it.

The return on equity was expected to have a relationship with systematic risk. However, the results reported otherwise: return on asset has no relationship with systematic risk during the years 2009 and 2010. It was contradictory to the expected, the year 2011 showed a significant positive relationship between return on equity and systematic risk. It is mean high return on equity have high systematic risk. In the year 2011 as the economy slowly recovered, companies' operating conditions on the surface was better and more improved than the previous years, in the years 2009 and year 2010, when viewed from the overall perspective, they were still losing money, after all, in a short period of time it was impossible to have a quick turn around; since firms were still in the recovery period, they did not have much money for shareholders as dividend; so shareholders' equity was also almost close to zero.

The results showed the operating efficiency (total asset turnover) does not have a significant relationship with systematic risk for firms each year. This may be because many firms in the Shenzhen of China stock market did not have high total revenue. High turnover generally shows effective asset management, whereas a low one usually shows poor asset management. The total asset turnover reflects the efficiency of management of investment in each of the individual asset items.

The results showed the asset liability ratio does not have a significant relationship with systematic risk for firms each year. This may be because many firms in the Shenzhen stock market had borrowed funds. The owners may seek higher leverage, either to magnify earnings or because selling new stock would mean giving up some degree of control.

The results showed the dividend payout does not have a significant relationship with systematic risk for firms during the years 2009 and 2010. This may be because for many firms the distribution of a small dividend, or for several years no dividends, at all as the management may want to keep profits for the company's future

development. There was dividend payout has a significant negative significant relationship with systematic risk in the year 2011, this result was similar to the conclusion of Borde (1998) as the dividend payout was closely negative associated with the systematic risk, it may the start to pay dividends, after all, in recent years, the economic was situation better than the previous years and also in order to increase shareholder's confidence in the company, because of the economic depression for many years the company's operating situation was not optimistic, and most of the companies had not distributed dividends or some companies did not plan to distribute dividends in several years.

Asset efficiency ratio has a negative relationship with systematic risk, when asset efficiency ratio is high and systematic risk is low, but the results showed the dividend payout does not have a significant relationship with systematic risk for firms each year.

The last hypothesis asset coverage ratio is having a significant positive relationship between systematic risk for the year 2011, the years 2009 and 2010 asset coverage ratio have no relationship between the systematic risk, because of its low turnover ratios and low profit margin on sales. In the backdrop of the global economy of recent years, tax rate increased in China, each firm faced payment of more tax fees than before, so many firms took on a lot of pressure, until slowly the economy rebounded in 2011.

6.3 Recommendations for Future Research

People who could benefit from the results of this study were mentioned in the previous chapter. The results and useful information presented in this study could benefit managers who wish to compare their firm’s performance to other firms within the China. Within the China they might use the same basic resources or face the same obstacles from uncontrolled variables, so it can reflect on how well the firm’s internal

management performs compared to anothers.

This study also provides valuable results and useful information to individual investors. Complete understanding of factors related to systematic risk is very fruitful as further information to support their decision whether to put more investment in the same company or to move their funds to other firms that have higher performance.

The issue of transparency of financial reporting is very important and very close relationship to the result of the study. One of the financial reporting objectives is to provide certain information to the investors that help them reach a fair value of their investment and ultimately stabilize stock prices which results in stabilized systematic risk. According to the results of this study, a number of implications and recommendations can be made. as follows;

1. For listed firms to publish information about systematic risk in the financial reports should be made mandatory.

2. Firms' financial reports contain quite a few, or barely, and financial ratio that are found associated with systematic risk. Financial reports contain only the three basic financial statements: balance sheet, income statement and cash flow statement. It should add financial ratios analysis and provide useful information to the investors. The current format of financial reporting takes into account only the legal considerations of reporting while ignores the financial analysis considerations. In this case, the current format of financial reports can be considered transparent to accountants only, which limits the use of financial reports by many other stakeholders who are involved with the firm's business.

3. There should be a mandatory rule for the firms to follow certain methodologies, like the one applied in this study, to relate the financial ratios to be published

regarding systematic risk. Eventually, this will help to improve the firm's business in terms of its assets, financing resources and sales.

4. Managers should know that excessive liquidity could waste financial resources, as they should be spent for profitable projects. High liquidity can increase the cost of "free cash flow" and raise the risk of wasteful use of cash assets. Therefore, to lower the Beta and increase the firm's value for their shareholders, companies should avoid holding too much cash and near-cash assets which are not needed for covering their short-liability.

5. Managers may need to use strategies to focus on more rapid growth by increasing their total assets to get more investors' attention and reduce risk at the same time. To achieve rapid growth rate, global investment could also be a good option.

6. Managers should develop the investment and financing strategies to increase total asset. This will help to improve the investors' confidence in firm's business which will ultimately help to decrease systematic risk and make equity to be less than assets or to decrease the equity to be greater than the increases in assets. In addition, when systematic risk is lowed, the firm's financing resources will be improved.

Further studies could include other influential factors such as politics, foreign investors or foreign ownership, exports and management efficiency of systematic risk. Further studies might focus on the same variables but can change to other industries within China or to other country. An analysis of similarities and differences within China and across borders may prove informative. Other financial structures may be used as indicators to identify the firm's performance. Time series may create different results, as the frequency of data may change from being yearly to quarterly or even monthly. The more data that is available for each study, the better it will be and we

can use the results to make more accurate predictions.

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