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BE305E Finance

Comparative Study of Companies' Financing Resources and Costs in China and Norway

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PREFACE

This thesis is accomplished to fulfill the requirement of Master of Science in Business education program in Bodø Graduate School of Business. For the specialization of Finance (BE305E), this thesis counts for 30 credits. And this is a big project work has been accomplish as my two-year master education. Throughout this thesis, the main task is to prove the skill of solving problems independently with the knowledge learnt from the master course.

The motivation of doing research on Chinese market comes from my friend Christian Johansen, who is very interested in having business in China. The knowledge I have gained from the finance courses provide me the skills to make an analysis on Chinese financing resources and costs. This will reveal some basic information of the Chinese market, and the comparative study in Norwegian market is to make the statements more Norwegian-friendly.

Before I proceed, I would like to thank my supervisor Professor Øystein Gjerde for valuable guidance and patient answering all my questions. The crucial assistance from him kept my work on the right tract and avoided my misunderstandings taking away my attention. As well as, I need to give acknowledgment to my friend, Fei Wei, who answered a lot of my questions in accounting standards. And I really appreciate the help from Stian S. Nustad, who did translate the abstract to Norwegian. And all the helps and supports from my dear friends when I was stressed with this thesis are highly appreciated. Without your confirmative words and friendly smiles, I would not have this thesis done.

Finally, I would give my sincere thanks to my parents. They are the persons who give me the opportunity to study and pursue my dreams. Even though they didn’t tell me everything, I can feel the love and support from their warm eye expression.

SAMMENDRAG

Siden den store økonomiske veksten i Kina, begynner nå flere og flere å tenke på å investere i Kina. Finansiering er veldig viktig når en investerer i et utenlandsk land med helt forskjellig kultur og økonomisk historisk utvikling. Denne masteroppgaven studerer de finansielle ressurser og kostnader i Norge og Kina. Formålet er å formidle informasjon til norske investorer om de tilgjengelige finansielle ressursene i Kina og deres tilhørende kostnader. Studien fokuserer mest på det kinesiske markedet og, og studiet på det norske markedet er en illusjon for å få norske investorer til å forstå forskningsresultatene mer nøyaktig.

Oppgaven introduserte først den nåværende økonomiske situasjonen i Kina, og deretter analyserte den økonomiske art, og det finansielle systemet i Kina sammenlignet med Norge. Studiet finner ut av de tilgjengelige finansielle ressursene i begge de to landene, basert på den fundamentale informasjon fra det kinesiske markedet. Med empirisk data av aksjemarkedet, obligasjonsmarkedet og lån, implementeres CAPM (Capital Asset Pricing Model) og etter skatt WACC (Weighed Average Cost of Capital) med i beregningene for kapitalkostnaden i begge landene. Sammenligningen er utført for å hjelpe investorer fra Norge til å gjøre best mulige finansielle beslutninger.

ABSTRACT

Along with the fast growing of Chinese economy, there are more people considering investing in China. Financing issues are very important in investing in a foreign country with totally different culture and history of economy development. This thesis studies the financing resources and costs in China and Norway. The aim is to provide information to Norwegian investor of the available financing resources in China and their corresponding costs. The study is mainly focusing on Chinese market, and the study of Norwegian market is an illustration which makes the Norwegian investors understand more precisely on the research results.

The paper firstly introduced the current situation of Chinese economy, and then analyzed economic type, type of financial system in China with comparison to Norway. Based on the fundamental information of Chinese market, the study finds out the available financing resources in both countries. With the empirical data of the stock markets, bonds markets, and loans, the research implemented CAPM and After-Tax WACC on calculating the cost of capital in both countries. The comparison is performed to help the investors from Norway making optimal financing decision on investing in China.

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1. Introduction

1.1 Background of Study

Ever since the start of economic reform in 1978, China has shown the most extraordinary economic rise with the speed and potential that has never been seen before. It has been recognized as a pillar of the world's economy by most of the countries, as its economy grew annually by an average of 9 percent between 1978 till 2008. In the year 2010, Chinese economy kept its high-speed growth and overtook Japan becoming the second largest economy in the world, right after United States of America (The World Bank Group, World Development Indicators, 2011). After the shock of the Late-2000s financial crisis, Chinese economy still keeps running on the high way, with annualized Gross Domestic Product (GDP) Growth 13.6% (International Monetary Fund, World Economic Outlook Database, September 2011: GDP list of countries. Data for the year 2010), and that attracts the attention of countless business investors and economists from all over the world. Investors are seeking investing opportunities in this strong growing economy and at the same time, economists are analyzing the reasons of Chinese economy's strong growth even when the world's economy is suffering the dramatic downturn. The statics of Foreign Direct Invest (FDI) in China shows the strong growth of investing in the world's fastest-growing major economy from the whole world; as the figure that published by Ministry of Commerce of the People's Republic of China (MOFCOM), the realized FDI in 2010 reached 114.7 billion US dollars, which increased 21.97% from a year earlier. And this growth of investment from the world will remain by the support from a growing domestic market in China. In the next 10 years, as Boston Consulting Group Inc. predicted in its report published on November 8th, 2011, Mid-class consumers with annual household incomes over 9000 US dollars will probably almost triple to 415 million in China. "Foreign companies tapping Chinese consumers will benefit from rising wages and will continue to invest in China," said Alan Liao, an economist at Chinatrust Commercial Bank in Taipei.

There are some negative signs of the Chinese economy recently; the national news agency, China News Service (CNS) reported on April 16th, 2012 that after the first quarter, the Chinese economy performed poorly: the Purchasing Managers Index (PMI), which indicates the companies' activeness in purchasing goods and service for manufacturing, has been staying at a low level around 50% for consecutively 5 month; the State Owned Enterprises (SOEs)faces the first time of declining in their profits in recent 3 years; the large scale industrial enterprises have decline in their profitability at 5.2%; around 30% of the listed manufacturing corporations laid off employees; moreover, the central government adjusted the expectation of GDP growth under 8%, and this is the first time the GDP growth rate become lower than 8% in recent 8 years. The latest news shows up a not bright future of Chinese economy. However, this scenario is mainly caused by the structure of Chinese industry, which is mainly labor intensive and export oriented, so when the labor cost increased in China, the competitiveness became less, especially the financial crisis in the western countries led a drop in demand of Chinese products (Larry H.P. Lang, 2009). However, as the premier Wen, Jiabo stated in his speech, March 2012, the slowing down in economy growth calls for more foreign investment, especially high technologies to China, and Chinese industrial sector needs a transform from labor intensive to modern high-tech industrials.

Moreover, the hinterland in China shows more than a potential market to the world's investors. Over the three decades, majority of the investment are concentrated in the opening up zones around southeast coast of China. When people talk about China, they always say Beijing, Shanghai, Guangzhou or Shenzhen; nevertheless, more than 70% of the Chinese population, that is, over 800 million people are living out of those so-called Chinese economic centers. After 1992, the Chinese government decided to open up the entire country to foreign investors, even though all the investments have to be certified by MOFCOM and other administrations in the government. The West Development project that is launched in 2000 from the Chinese central government fosters both domestic and international investment to the hinterland of China. As the central government meeting reports said, the 6850,000 square kilometers territory in the West Development project, that is, 71.4% of the totally territory of China, only shares16.8% of GDP by the end of year 2002. This uneven developing situation calls for more emphases on investing into the west China, and as the premier stated, the up-

to-date technologies are the most feasible element for the government because the negative environmental impact in the east part of China has given a painful experience to Chinese people. To overcome the bottleneck of environment impact during the economic development, Chinese government is working hard on attracting western up-to-date technologies by promising that China has been and will remain the most attractive investing destination in the world.

1.2 Purpose of Study

As an active member of the world, Norwegian investors cannot miss the opportunity of obtaining the profit and market share in the fastest uprising economy, which has shown a much more open attitude and unlimited potential already. The only turbulence in between these two countries is the political related conflict, the 2010 Nobel Peace Prize. This type of unpredictable cultural conflict causes the cooling down in all the connection between China and Norway including the economic cooperation. However, the thirst of technology in China can overcome this unspoken conflict. The difficulties can be optimistically regarded as a temporary problem. Even in the response to the Nobel Peace Prize, the Chinese government stressed again that the cooperation between China and Norway has been highly appreciated. And it is obvious that United States of America has much more of this type issues than Norway does, especially the prize is not a governmental decision, but Chinese government is still taking USA as a strategic counterpart. So the conclusion can be that political conflicts are always contemporary in front of the long-term economic benefits. Furthermore, Norway is famous in its prior position in industrial technologies, and that is what China wants the most. Meanwhile, the Chinese legal regulations have been strengthened after its accession to the World Trade Organization (WTO), and the legal system in the country is getting closer and closer to the international standards. With commitment to the Trade Related Aspects of Intellectual Property Rights (TRIPS) became into effect on January 1, 1995, Chinese government’s efforts on protecting the intellectual properties can be proven by those cases that foreign

companies have won in protecting their trademarks or patents in Chinese market. Norwegian investors can also protect the technical advantages while they are operating in Chinese market, and chase the optimal market volume with advance technologies in either management or manufacturing.

Even though the excitement of running a profitable business in China may dominate in investors' mind, one of the most important steps in surviving in a totally different market like China should have been taken far ahead of the implementing ideas in practice, which is a thorough study of financing resources and costs in China. Inasmuch as we have seen so many bankruptcies related to financial failures during the first decade of 21st century, the investors all over the world have reexamined the concept of business, which has experienced upheaval during the Late-2000s financial crisis, and thus the financing resources and costs in business running has become crucial in modern criteria. Not only for surviving, but also for thriving in 21st century, the investors should have much deeper and thorough awareness of the financing strategies at every single moment they make decisions. Optimal financial strategies, that is, pragmatic combination of financing resources and costs are the comparative advantages in business operation as they can reduce the cost of the commodities or services that the company provides, as well as offer flexibility in business running processes, and most of all, give more opportunities in business innovations. A good financing situation provides stable business environment and higher margin that enhance the ability in innovation, because the investment of Research and Development mostly comes from the profits that the firm gained in running the business. Thus lower financing costs and stable financing resources deliver competitiveness in the market, and are the fundamental aspect of overall success in modern business. In addition, as an international investor, the best way to understand those financing practice in China is having a comparative study on it between China their home country, thus, Norway in this paper. So what are the available financing resources in both China and Norway as well as what are the costs of them will be the main topic.

1.3 Relevant Theories and Materials

Along with the increasing popularity of investing in China, the debates on Chinese financial system are more frequently found on news and academic articles. Some of them give optimistic predictions but some are very critical about the extraordinary rise that based on an implicit reform. Such as the outlook for Chinese economy made by Angus Maddison(1998), that is, China would probably reach US levels of GDP by 2015 and would account for about 17 percent of world GDP have a per capita income nearer to the world average. On the other hand, some economists criticize the Chinese economy is not the genuine market economy and it is not a rational arena. Carl E. Walter and Fraser J. T. Howie (2011) even argued that the engine at the heart of the debt markets in the valuation of risk and this is missing in China … Similarly, the heart of stock market is the valuation of companies and this is also missing in China … Moreover, the studies on financing costs are much calmer in comparison. Some of the researchers examined the impact of securities transaction taxes in Chinese stock market, and they conclude that Chinese stock market has the same characteristics as the western ones. In 2009, Yongyang Su and Lan Zheng published their empirical study, The Impact of the Securities Transaction Taxes on the Chinese Stock Market, which concludes that on average, a 22-base-point-increase in the Securities Transaction Taxes (STT) rate is associated with about a 28% drop in trading volume, while a 17-base-point-reduction in the STT rate is associated with about a 89% increase in trading volume in the Chinese A-shares market. Nevertheless, according to the latest regulation that amended on May 30th, 2007 by The Central Government of the People's Republic of China, corporate bonds do not need to pay the transaction taxes in China, so the STT are only applied to A-share and B-share in the market, moreover, outside the market, the State Owned Shares and Legal Shares are duty free as well. Move on to the bond market, there are five types of bonds issued in China: state Treasury bonds, financial bonds, enterprise bonds, investment bonds and foreign-currency bonds. Annual quotas, established by the People's Bank of China (PBOC--the central bank) in consultation with the National Development and Reform Commission (NDRC) and approved by the State Council, govern each category of bonds. Corporate bond issues are used mainly to solve fund shortages at enterprises with promising futures and to fund key construction projects (Country Finance China 2011, August 2011). In the Country Finance China 2011, it mentioned that although

normal tax regulations should apply to interest earned on corporate bonds, the tax authorities often grant a tax exemption to make a bond more attractive. They are known to do this where there is a large state-owned enterprise involved.

The Norwegian financial markets show its mature status comparing with the ones in China. The first Norwegian Stock Exchange Act was amended in 1818 and there have been numerous studies on equities. Researchers have studied on the stock returns and corporate bonds interests from variety of aspects. In the research report, The Stock Market and Investment in the Small and Open Norwegian Economy (Øystein Gjerde et al, 2000), the researchers conclude that the stock market returns correlate negatively with lagged growth rate of investment and positively with current growth rates of production, in addition, the changes in interest rates have a positive effect on future stock returns. Also in 2011, Marit Erlien in his thesis Earnings Announcements and Stock Returns – A Study of Efficiency in the Norwegian Capital Market, confirmed a high degree efficiency of Norwegian financial market. On the other hand, the study of Norwegian bond market is fast developing. In 2004, Ketil Johan Rakkestad gave his analysis that challenged the traditional belief of taking government securities as benchmarks for long-term interest rates but the use of the swap market as a benchmark market when pricing corporate bonds. Moreover, recently the financial institutions in Norway got favor in OMFs, "obligasjoner med fortrinnrett" in Norwegian, which is a type of covered bonds that give the investors recourse to a specified pool of the issuer's assets. So the study on Norwegian financial market has been developing every single second, but there isn't any recent research on overall financing cost for the firms in the country either.

Following all those researchers' great steps, this paper can extend the analysis to financing costs in both China and Norway. Based on the results and tips given from cost of capital studies, it can be much more illustrative during the model selecting and building process in this paper. However, the aim of this paper is providing an up-to-date study of a practical issue in the business operation that is financing resources and their costs in China and Norway. So the timeliness, or currency, of the data is crucial in order to cope with the fast changing situation in 21st century, and thus the data in this paper is mostly collected directly from Shanghai Security Exchange Database and Oslo Børs Statistics. At the same time, relevant news reports about the financial

situation and unspoken rules are very important to approaching the truth of the business operations in a practical vision, and the insight of cultural differences can be shown during the process of analyzing markets and regulations in China and Norway.

1.4 The Structure of the Thesis

In order to get a sound image of financing resources and costs in China and Norway, this thesis will be constructed with seven parts as follows: 1. Introductory part of economy and financial systems, which consist of economic type, financial system features, taxation rules and investor's protection; 2. The chapter of Theoretical Framework and this chapter argues the components of financing cost and modeling in analysis; 3. Methodology part that shows the philosophy of the research, including the choice of research design, data collection and interpretation, evaluation of data's validity and reliability; 4. Empirical part, and this is one of the most important parts since in this chapter, the empirical data will be processed with implementing the theories argued before, and provide relevance of the model based on the practical situations; after all, the calculation will be performed in the chapter as well; 5. The Comparison between China and Norway, which will be conducted in different dimensions, such as over-all comparison and industrial comparison, etc., moreover, the analyzing part that provides a concrete strategic vision of what should companies do in China; 6. Conclusions, in which summarizes the findings and gives suggestions to further study on this topic.

The research is constructed as stated above to clarify the circumstance out of blurry and chaotic image, and then complete the analysis step by step that means each part of the thesis is prerequisite to the further analysis and based on the previous commitments.

2. Economy and Financial Systems

2.1 Brief Comparison in Markets

When the investor makes decisions, an overview of a county's market is the most fundamental step to take. And the publications from The World Bank and International Financial Corporation are the first choice as it has high precision and timeliness. As stated in the latest report from Doing Business Project, with is developed by The World Bank Group, among 183 economies, Norway is ranked at 6th Ease of Doing Business and China is placed at 91. This ranking is based on an integrated index that consists of Stating a Business, Dealing with Construction Permits, Getting Electricity, Registering Property, Getting Credit, Protecting Investors, Paying Taxes, Trading Across Borders, Enforcing Contracts, and Resolving Insolvency. The distance in ranking can be an alarm to the investors from Norway, because the difficulties they may meet in China are way more than the ones they will meet in Norway.

From the components of the ranking index, the biggest difference between Norway and China is Dealing with Construction Permits. Meanwhile, the differences in the indices of Paying Taxes and Protecting Investors between Norway and China are significant. For the Paying Taxes index, the measure includes the percentage of the firms' profits must as taxes and numbers of hours spent preparing, filling and paying the taxes. The average time for preparing, filling and paying the taxes in China is 398 hours per year; on the contrary, it only takes 87 hours per year for the firm to accomplish this task in Norway. Moreover, the total tax rate in Norway, 41.6%, is 21.9% less than in China, 63.5%. This may be a little bit surprising to the investors in Norway since it is a country famous for having heavy tax. Another important aspect to be concerned is the Protecting Investors, which is measured in the dimensions of transparency of transactions, liability for self-dealing, and shareholders' power. The overall investors' protection index in Norway is 6.7 out of 10, and with the magnitude from 0 to 10, the Extend of Disclosure is 7, the Extent of Director Liability is 6, the Ease of Shareholder Suits is 7. Nevertheless, with the same gauging scales, the overall investors' protection index in China is 5, which has 10 points in the Extent of

Disclosure, only 1 point in the Extent of Director Liability, and 4 points in the Ease of Shareholder Suits. The lower level of investors' protection causes higher risk in investing, which always results in a higher expectation in return from the market. However, the ranking of index of Getting Credits in Norway and China are not that far apart, that is, only 19. It indicates that both of Norway and China are not easy to get credits. In a deeper comparison conducted by the World Bank Group survey, the Strength of Legal Rights in Norway is slightly better than in China, but the Depth of Credit Information index shows a sound credit information coverage, 100% of adults, from private bureau in Norway, at the same time, the credit information coverage is 82.5% of adults in China and it is only provided by the public registry.

The comparison above is based on a macroeconomic perspective; the reasons of all the differences can be explained in several ways, such as economic type, financial system type, etc.

2.2 Economic Type

Every country has its own history with different paths of developing the economy, and the economic types, i.e. economic systems, are commonly categorized into Traditional Economy, Market Economy, Planned Economy, and Mixed Economy. As David W. Conklin stated in Comparative Economic Systems (1991:427), the "economic system" refers to the organizational arrangement and processes through which a society makes its production and consumption decisions. So to distinguish the economic types, we have to examine the key features of the economy on these aspects pointed out by Professor Conklin.

Before 1840, China had been a Traditional Economy for over 2000 years with absolute monarchy regime and government leading economy. Chinese philosophy denotes merchants are non-diligent villains, and promotes agriculture first. Along 2000 years of monarchy history in China, from Qin Dynasty till the end of Ch'ing

Dynasty, all the emperors have their policies according to the agriculture first philosophy, so the commercial activities are strictly restrained. All the international trades were conducted by the central government, which were used to satisfy the consumption or curiosities of the royal family members and government officials. Chinese economy had never been opened to the world before the First Anglo-Chinese War, which led to an opening up of its economy with Treaty of Nanking in 1842. Since then, Chinese economy started its first time to get integrated into the world market as well as the modernization of Chinese industries.

However, the establishment of People's Republic of China (PRC) became a sharp revolutionary point in Chinese economical development, and the country totally abandoned its track of integrating into the world. After the Korean War, 1950 to 1953, China left both herself and North Korea ever isolated in the world. On another hand, PRC used to be called the Communist China, which, as it shows, means the economy is firmly controlled by the government like it was taught in Soviet pattern. The degree of central control was much greater than under the Ch'ing dynasty or the Kuomintang. It reached to the lowest levels of government, to workplace, to farms and to households. The communist party was highly disciplined and maintained detailed oversight of the regular bureaucratic apparatus. Landlords, national and foreign capitalist interests were eliminated by expropriation of private property (Angus Maddison, 1998). This means the traditional economy had been totally abandoned in China and the country shifted to Planned Economy. PRC government took the power to make collective decisions on allocating the resources and distributing the outputs, at the same time, the government arranged the labor and provided social welfare. Everything was tied up to the central government in China, or the Chairman Mao, and the decisions from the one person shook the country even the world. The low efficiency in economy caused a lot of challenges in China, such as the Great Famine from 1958 to 1961, which caused approximately 36 million deaths (Yang Jisheng, 2008). However, the final attack to the economic system came from a political movement, the Great Proletarian Cultural Revolution. This nationwide riot has shaken the communism belief in China and brought a pragmatic regime after Deng Xiaoping took over the top power in the country. Deng promoted a reform and opening up in China, which is recognized as milestone in Chinese history, as well as a great turning point in the Chinese economic system. Ever since the Chinese economic reform,

Chinese economic system is gradually changing towards the market economy. Private sectors and foreign investments are allowed to exist in China but some of the industries are still solely controlled by the central government. Since the country has its past time with national ownership, the allocation of resources is still under the standard of market economic system. For example, getting a construction permit is very difficult because of the ownership of land belongs to the government, and trading the land has to be approved by numerous bureaucratic processes. As the data from Doing Business Organization in 2012, it requires 33 procedures and on average 311 days with cost 444.1% of income per capita to deal with construction permit, so that China is ranked 179 out of 183 in this index. Neither is the financial market in China liberated, the big four national banks control 43% of the financial assets in entire country (PBOC Financial Stability Report 2010), and it causes the free capital has very low efficiency in investing.

As a condition to the accession to WTO, Chinese economic regime has been modified more and more to the standard of a Market Economy and the government's oversights and direct control have been limited or prohibited. But, at present, with several key industries under control by the government, Chinese economy is still a Mixed Economy emerging from the Planned Economy.

The Chinese economy has never been really integrated with the world economy; it only experienced traditional economy stage and semi-colonial economy that mixed with traditional economy and western-led market economy, however, the Norwegian economy has been a typical small open economy. Even before the independence of Norway, the Norwegian economy was based on traditional agricultural economy along with a domestic and international trading merchant fleet (Ola Honningdal Grytten, 2010). After the independence in 1814, Norway kept its open economy and acted as one of the most competitive player in vessel freight industry in the world that offered around 7% of the worlds merchant fleet in 1875 (Ola Honningdal Grytten, 2010). Till the World War II, Norway experienced a capitalism market regime as a small open economy. After the war, the Labor Party, who came to power from 1953, implemented a strict social democratic rule that increased the nationalized sectors in the economy and extended the centralized economic planning. However, in 1981 a conservative government replaced the Labor Party regime and Norway joined the

international trend of credit liberalization (Jan Tore Klovland, 2004). The scare resources are allocated by the market power and the productions are determined by the market demands. But the Norwegian economy still has a widespread of nationalized sectors especially in the petroleum industry and financial industries. However, comparing with Chinese market, the financial industry in Norway is very liberal nowadays. Apparently the Norwegian economy is still a small open economy with an obvious characteristic of Mixed Economy, but it is historically Market Economy based.

Both China and Norway have the Mixed Economy at the moment, but the differences cannot be omitted and these differences, which include, but not only, historical economy status, leverage of government power, and mature status of financial institutions, are the fundamental reasons to the problem Norwegian investors will meet in China.

2.3 Financial System Type

Zoom in to financial systems from the economic types. In order to get an insight of the cost of capital, it is better to have a further understanding of the financial markets and institutions, be aware of the roles that these institutions play in different parts of the world. How these financial institutions work determines what type of financial system an economy has.

There are varieties of financial institutions in the world, but to put them in to category, they can be sorted as banks, exchange, insurance companies and other, such as trust investment companies and mutual fund management companies. But from the viewpoint of financing resources, there are only banks and market, which includes bond market and stock market. So the companies can either get financed from the bank or from the market. For example, company financing in the United States is different from that in most other countries. The United States not only has a large

amount of bank loans outstanding, but there is also a large stock market and large corporate bond market. Thus the United States is said to have a market-based financial system. Stock market value is also high in the United Kingdom and Asia, but bank loans are much more important than the bond market in these countries. In Europe and Japan, bank financing again outpaces bond markets, but the stock market is relatively small. Most countries in Europe, including Germany, France, Italy, and Spain, have bank-based financial systems. So does Japan. (Brealey et al. 2011)

Different financial systems have their advantages and disadvantages. The market-based financial systems seem to be particularly successful in developing brand-new industries. For example, in twentieth century, the United States led development of mass production in the automobile industry, even though the automobile was invented in Germany. The commercial aircraft industry was also mainly developed in the United States as well as the computer industry after World War II, and more recently the biotechnology and Internet industries. All of these new industries got great financing from the market-based financial system. The reason that market-based financial system is better at fostering innovative industries than bank-based financial system is that when new products or processes are discovered, there is a wide diversity of opinion about the prospects for a new industry and the best way to develop it, and at the very right point, financial markets accommodate this diversity, allowing young, ambitious companies to search out like-minded investors to fund their growth. However, it is much harder to receive financing when it has to come through a few major banks. Moreover, the market-based systems also seem to be more effective at forcing companies in declining industries to shrink and release capital. When a company cannot earn its cost of capital and further growth would destroy value, stock price drops, and the drop sends a clear negative signal. (Brealeyet al. 2011) However, there are some shortcomings of the market-based financial systems. Opaqueness is the fatal problem for market-base financial system. Always the investors are under the threat of being unable to receive sufficient information from the companies' daily operation. Also this is an issue of the protection of investors from legislation and business commitment. A market-based financial system requires much higher protection to the investors, but the transparency and governance of the companies that receive the investment from the market are always imperfect. There is no way to secure the transparency since laws and regulations can only set the

boundary to the managers of what they cannot do other than what they can do. So that there is always some patch the managers may try to conceal crucial information to the investors.

On the other hand, we need to inquire of the bank-based financial system. Advantages of bank-based financial system are providing the companies with long-term competitive advantage, and higher transparency and governance of the companies' operation. Firstly, the bank-based financial systems always have several major banks that financing groups of companies, and this kind of structure will lead the banks have a long-term invest perspective. The major banks can be the stakeholder of the companies and sometimes directly get involved in the management of the companies that the banks finances. So the protection from the bank to the firms can be very strong during some short-term difficulties, for example, when Mazda faltered in the 1970s, Sumitomo Bank guaranteed Mazda's debts and orchestrated a rescue, in part by exhorting employees within its keiretsu, the network of companies that organized around a major bank, to purchase Mazda cars. Sumitomo Bank had an incentive to undertake the rescue, because it knew that it would keep Mazda's business when it recovered. In the bank-based financial system, the companies are always organized by the major banks, so that cross-holding of each other's stocks or debts is very often. Thus we got the second advantage of the bank-based financial system that is higher transparency and governance. Since the major banks in the system will have very much direct or indirect control of the firms' operation and most of the time because of the cross-holding structure of all the firms in the bank's organization, the transparence and governance is relatively higher than market-based financial system. Such as in Japan, within the keiretsu the top managers from both financial institutions and non-financial firms will have meetings regularly or time to time (Brealey et al. 2011). Nevertheless, there are several disadvantages of bank-based financial system. Because of the strong connection between banks and firms, the bank may bail out the uneconomic firms and insist on rescuing some companies that will fail eventually. This kind of big failure happened in Japan, a coalition of banks kept the Japanese retailer Sogo afloat for years, despite of clear evidence of insolvency. When Sogo finally failed in 2000, its debts had accumulated to JPY 1.9 trillion (T.Hoshi and A.Kashyap, 2004). Another disadvantage of the bank-based financial system is that the financing of the new industries is very limited. Most of the banks and financial

institutions are very risk aversion; they would rather invest in the mature industries instead of the innovative but risky firms. So in this kind of financial system, new and small firms are considered to have more risk in operation and they are harder to obtain financing.

Over the discussion of different types of the financial markets, a basic image of the financing environment of the firms is shown. The companies that are operating in market-based financial system have different financing cost structure from the ones operating in the bank-based financial system. And the difference in the structure would definitely influence the total cost of capital. But identifying a financial system should be done with analyzing the empirical data. The solution is to get the total values of bank loans, private (nongovernment) bonds, and stock markets in the country during a certain period of time. Meanwhile, to measure these financial claims on a comparable basis, the amounts should be scaled by GDP. And then, compare the percentage of bank loans, stock market, and private bond market to find out the dominant financing resource in the country. This percentage shows the dominance of the bank or the market, which can determine whether the country has a market-based financial system or a bank-based financial system. Even though any type of the financial system has shortcomings, the strategies in financial management can improve the financial condition by combining the international financial instruments.

2.4 Taxation

The taxation in a country has a strong impact on the business, and businesses respond by executing strategy that allows for tax savings and avoiding transactions that are heavily taxed (Bodie et al. 2011). The financial activities are also under the same condition, which indicates the choice of financing resources can be adjusted to the taxation policies. In other words, the taxation policy in the country can be neutral to debt and stocks financing, or it can be feasible to any type of them. So the company’s

capital structure, the combination of different financing resources, should be optimized according to both the market circumstance and the taxation policies.

According to the taxation policies in Norway and China, there are conventional corporation taxes applied in practice. So debts can deduct the profits and decrease the profit tax. Moreover, the tax rates and tax policies in these countries are different that means the leverages of the tax impact are different. From the data provide by Doing Business Organization in 2012, there are several types of taxes or mandatory contributions, which have taxable profits as tax base, relating to the tax deduction. In Norway, the profit tax, the only one based on the taxable profits, is 28% of commercial profits. In China, the corporate income tax rate is only 20%, and levies for construction and maintenance of river projects takes 1% of the business profits. Nevertheless, the stamp duty is amended in China that means the transactions of securities are taxed, but according to the current taxation policy, corporate bonds are excepted from security transaction tax. This means the real tax deduction on debt financing in China that is the taxable profits based tax rate, 21%, without subtracting the stamp duty rate, 0.01%, is still 21%. Furthermore, Chinese government may have special tax exemption to bonds market as stated in the first chapter, and this makes it is much more complicated to estimate the cost of debt in China.

Thus the higher profit tax rate in Norway, there is a stronger initiative to obtain financing from debts in Norway than in China. But this is only based on taxation preference, and in the financial market, investors take much more than taxation policies in to consideration.

2.5 Investors' Protection

Other than the taxation impacts, the protection to financial market investors is another essential element that influences the financing costs. The term of "investor protection" refers to the efforts and legal actions that facilitate the outside investors being

informed and regulating the inside managers of projects or companies that are invested (Charles P. Himmelberg et al. 2002). The financial market is a risk versus profit platform, on which investors take risks to pursue profits. The investors in the financial markets are managing portfolios with certain risks and earning the risk premium as the market equilibrium (Bodie et al. 2011). However, the risk premium varies in different financial markets, and the investors' protection is one of the most driving powers.

Charles P. Himmelberg, R. Glenn Hubbard and Inessa Love, 2002, argue that the weaker investor protection causes higher concentration of inside equity ownership and the higher concentration of inside equity ownership implies a higher cost of capital. As well as Rui Albuquerque and Neng Wang, 2004, they have proven that the countries with weaker investor protection have higher expected equity returns and return volatility, higher dividend yields and higher interest rates. In the paper, Investor Protection and Economic Growth, 2009, Haidar, Jamal Ibrahim stated that countries with stronger investor protection tend to grow faster than those with poor investor protections.

As the data mentioned in previous chapter, Norway has a better investor protection than China. The advantages Norwegian financial market has are extend of director liability and ease of shareholder suits, therefore the investors in Norway has better legal protection against the inside operations and more responsible directors. So that the investors have a lower expected returns from the financial market in Norway.

3. Theoretical Framework

3.1 Introduction

In the theoretical chapter, the knowledge structure for studying the financing costs is built. In order to get a sound and accurate analysis on financing costs, there is a great necessity to understand the notion of financing cost, the theories on calculating the over-all financing cost and its components, and relevant financial models. To accomplish all the missions mentioned above, the theoretical chapter is divided into three parts as Components of Financing Cost, Capital Asset Pricing Model (CAPM), and Weighted Average Cost of Capital (WACC).

The first part of theoretical framework explains the components of financing cost, which consist of cost of capital and financial expenses. Moreover, the argument of perfect market, the market conditions that the study is based on, is included in this part as well.

In the second part of theoretical framework, argues the Capital Asset Pricing Model, which is mainly used to calculate the cost of equity. The argument in this part is mainly about the assumptions of CAPM, the formula, and interpretation of each part in the formula. Also the differences in implementing CAMP in different markets are introduced in this part.

And the last part in this chapter is the introduction of Weighted Average Cost of Capital, the approach that measures the overall cost of capital consists of both equity and debt. Furthermore, the development of WACC with concerning taxation, the after-tax WACC, is introduced as a more realistic formula.

3.2 Components of Financing Cost

As a summarize of all the definitions online, the Financing cost, also known as Cost of Finances, is the cost, interest and other charges involved in transaction of

borrowing money to accomplish business projects, build or purchase assets, and invest in other business operations. Therefore the components of the financing cost include cost of capital, financing fees, security transaction taxes, and other related expenses. According to the final destination of the financing cost, all these items can be categorized into two groups, Cost of Capital, which goes to the investors in the market, and Financing Expenses, which goes to the government and people or institutes in the transactions.

3.2.1 Cost of Capital

The cost of capital is a term used in the field of financial investment, which refers to the average return rate demanded by the investors in a company in the form of debt and equity (Brealey et al. 2011). From this definition of cost of capital, we can tell that it consists of two parts, one is debt cost and the other is equity cost. So the calculation in response will be the calculation of debt cost and the calculation of equity cost, and then summarized both of the parts into the total cost of capital.

3.2.1.1 Cost of Debt

Comparing with the calculation of cost of equity, cost of debt is much easier to be computed. The calculation is mainly done with weighted average. There are two important components to the cost of debt, cost of corporate bonds and cost of bank loans. When analyzing the bonds, we have to note a key feature of the corporate debt that is the companies have the option to default in their bonds. Default risk is very frequently considered when the investors buy the corporate debts therefore this element is very crucial to estimate the cost of debt in the company’s cost of capital.

To compensate for the possibility of default, corporate bonds must offer a default premium that is the difference between corporate bonds’ promised yield and the risk-

free bonds such as the government treasury bills. The greater the default risk is, the higher default premium should be.

In the argument of bonds, the risk of bonds is evaluated by the level and trend of some of the issuer's financial ratios. There are 5 key ratios that are widely used by bond rating agencies. 1. Coverage ratios. These are the ratios of company earnings to fixed costs. Low or falling coverage ratios indicate earnings will not cover the fixed interest costs, i.e. the cash flow is insufficient. 2. Leverage ratio. This ratio is called debt-to-equity ratio as well, and it has the function to signal the firm's excessive indebtedness. When the leverage ratio is very high, it means the firm has to make very high profit to pay back its bonds. 3. Liquidity ratios. These ratios gauge the firm's ability to pay bills coming due with its most liquid assets. 4. Profitability ratios. These ratios are showing the rates of return on assets or equity. Profitability ratios indicate the overall financial health, and the higher profitability the firm represents a better ability to pay off the debts. 5. Cash flow-to debt ratio. This is the ratio of total cash flow to outstanding debt. (Bodie et al. 2011) After the rating of the firm, the investors and determine the risk of investment in its bonds.

The analyses above pointed out the rating of bonds' risk on which the cost of debt depends. Nevertheless, the over-all market cost of debt, risk premium plus the risk-free turn rate, is always calculated by the weighted mean value of all the corporate bonds in the market, which takes the financing value as the weight and calculate the average return rate. This method gives the balanced understanding of corporate bonds' return rate, since the more financing value the bond has, the greater impact it has on the bond market interest rate. The weighted average dilutes the impacts from extreme financing bonds with small financing values.

$$r_{dBonds} = \sum \frac{Total\ Issued\ Value\ of\ Bond\ i}{Total\ Issued\ Value\ of\ Corporate\ Bonds} \cdot r_{Bond\ i}$$

And in the equation, $r_{Bond\ i}$ is the interest rate of Corporate Bond i, and r_{dBonds} is the market average turn rate of corporate bonds, that is, the over-all market cost of debt. In the same way, for acquiring the cost of debt in a certain industry, researchers

commonly use the arithmetic mean value of all the corporate bonds' interest rates in that industry.

Besides the corporate bonds, the bank loans are another important component of debt financing, also the cost of bank loans is an important part of cost of debt. And the interest rate of bank loans is calculated with weighted average as well. The difference is the bank loans' interest rates vary according to the length of borrowing. But for the entire market, even a specific company, we need to get the average cost of bank loans when we have no idea of obtaining which length of loans. And the market has loan length distribution that we can take as weights of the probability of getting those lengths of loans. In equation, it is:

$$r_{dLoans} = \sum \frac{Total\ Value\ of\ Loan\ with\ Length\ i}{Total\ Value\ of\ Bank\ Loans} \cdot r_{Loan\ Length\ i}$$

Where r_{dLoans} is the average interest rate of bank loans,

$r_{Loan\ Length\ i}$ is the interest rate of a specific length loans.

After the average bank loan interest rate and average corporate bonds' interest rate are found, the adding up these two interest rates is accomplished with weighted average as well. The weight is the total financing value of the corporate bonds and total financing value of the bank loans. And it can be expressed as follows:

$$r_d = \frac{Loan\ Financing\ Value}{Total\ Debt\ Financing\ Value} \times r_{dLoans} + \frac{Bond\ Financing\ Value}{Total\ Debt\ Financing\ Value} \times r_{dBonds}$$

And the r_d is the overall cost of debt.

3.2.1.2 Cost of Equity

The estimation the cost of equity is a key point after the analysis of cost of debt. There are many models of estimating the firm's cost of equity, or from the investor's view, the price of stocks.

3.2.1.2.1 Capital Asset Pricing Model

So for the first approach, is the Capital Asset Pricing Model, CAPM, which is developed by William Sharpe, John Lintner, and Jan Mossin from 1964 to 1966 based on the foundation of modern portfolio management designed in 1952 by Harry Markowiz. In the implementing the CAPM, commonly there are 6 basic assumptions as follows: 1. All the investors are price-takers in the market; 2. All the investors plan for one identical holding period; 3. Investments are only available in the publicly tradable assets; 4. Investors pay no taxes on returns and no transaction costs on trades in securities; 5. All investors are rational mean-variance optimizers; 6. All investors have homogeneous expectations. (Bodie et al. 2011)

The assumptions above give an outline of the environment CAPM is working in, that is, a perfect competition and no government taxation. Although the latest technologies in stock exchanges decreased the information gaps, there cannot be perfect information in the market. However, the financial market, including share and exchange market, is commonly believed as the closest to perfect competition market (Walter & Howie, 2011).

Following the assumptions on the market from CAPM, the equilibrium in the security market can be explained by several elements that derive from the market portfolio and the certain stock. In details, the expected return of the capital asset is estimated by the return of market portfolio and its proportional to the risk premium of the market portfolio. In mathematical function is:

$$\textbf{Expected stock return } (r_E) = r_f + \beta \cdot (r_m - r_f)$$

In the equation of expected stock return, r_f is the risk-free return rate, such as the interest rate of long term government bonds; $(r_m - r_f)$ is the risk premium of market portfolio, the amount by which an asset's expected rate of return exceeds the risk-free

interest rate; β is the sensitivity of the expected excess asset returns to the expected excess market returns.

In this research the daily stock return rate has to be re-calculated, since the stocks are not traded every day in the year but the annual risk-free return rates counts every day. Set the trading day stock return rate as R, the daily stock return rate as R_{ek}, and the number of total trading days in the sample period as n. Since the first trading day does not have return rate in this research, the total valid number of days with daily return rate in the sample is $(n-1)$, and then the equation is:

$$R_{ek} = \frac{R \times \frac{n-1}{3}}{365}$$

The same process to market benchmark index daily return rate, but replace the stock daily return rate R by the index daily return rate $R_{index\ daily}$, so the equation is:

$$R_M = \frac{R_{index\ daily} \times \frac{n-1}{3}}{365}$$

(n is the number of days the stocks are traded in the sample period)

Overall, mathematically the CAPM regression function can be expressed as follows:

$$R_{ek} - \frac{r_f}{365} = \alpha_k + \beta_k \cdot \left(R_M - \frac{r_f}{365}\right) + \xi_{ik}$$

Where R_{ek} is the daily return rate of the SSE sector index in the industry k

r_f is the annual risk-free return rate

$\alpha_k$is the constant term

β_k is the sensitivity coefficient between industry k and the whole market

R_M is the daily return rate of the SSE composite index

After that, the estimation of beta is mainly based on the statistic analysis. In the research, we have the historical data of the firms' stock return and market return. The

simple linear regression coefficient between the stock return and the market return is the figure of beta. And this regression coefficient can be found from Ordinary Least Squares (OLS).

1. Set up the regression function:

$$\boldsymbol{r_E = r_f + \beta \cdot (r_m - r_f) + \varepsilon}$$

2. Minimize (ε^2), where $\varepsilon = r_E - \alpha - \beta \cdot r_m$

$$\min_{\hat{\beta}} \hat{\varepsilon}^2 = \min_{\hat{\beta}} \sum_{i=1}^{n} [r_E - r_f - \hat{\beta} \cdot (r_m - r_f)]^2$$

3. Find out $\hat{\beta}$ from the minimizing.

However, it must be calculated from the stock return percentage and market return percentage, otherwise the regression of other figures such as the stock prices and market index will not show the beta. After that, from the knowledge of statistics, we can calculate the standard errors of the estimated beta from the regression to show the extent of possible mismeasurement. Therefore, we have to set up a confident interval of the estimated value plus or minus two standard errors. With Student's t-test, we can find out the probability of having the right beta in the estimation.

Despite beta, choosing the relevant market portfolio is another important factor in calculating the cost of equity in CAPM. When sum over, or aggregate, the portfolios of all individual investors, lending and borrowing will cancel out, and the value of the aggregate risky portfolio will equal the entire wealth of the economy, and this is the market portfolio (Bodie et al. 2011). The market portfolio gives the market return standard, since it has the optimal combination to achieve the lowest level of risk for any possible return with risk-free investment and risky but high return investment. The market return rate, r_M, can be generated from the market portfolio. Normally, the studies on stock return rate use the annual return rate calculated by comparing the closing price on last trading day. But these closing prices at the end of the year have their daily changes, and this specific day's variance influences heavily on the annual return rate. To absorb this unexpected impact in this research, research use daily return rates from the market benchmark index closing prices, and obtain their

arithmetic mean value then multiply the number of average annual stock trading days, to get the share market's annual return rate. Because the first day in the sample cannot obtain the daily return rate, the number of trading days in arithmetic average function should have been corrected by less one, but the calculation for the annual return rate with multiplying the number of average annual stock trading days, just automatically sets the first day with average daily return rate of the sample period. Express mathematically, it is

$$\bar{R}_M = \frac{\sum_{i=1}^{n} r_i}{n-1}$$

$$r_M = \bar{R}_M \times \frac{n}{N}$$

Where $\bar{R}_M$ is the average daily market return rate

r_M is the annual market return rate

r_i is the return rate on day *i* (statistically *i* starts from 0)

n is the number of days the stocks are traded during the sample period

N is the number of years of the sample period.

Furthermore, the investors need to understand what kind of risk that he or she is facing, so that what kind of market portfolio can be taken as the reference. For the domestic investors, they have the market portfolio domestically; the combination of risk-free assets and risky assets is only limited by the market risk within the country and their assets are diversified according to the local risk. Therefore this diversification in financial structure will influence the ratio of debts and equity in the firms as well. When the investors are facing international market, the market portfolio will differ from the domestic one. And more risk will show up in the international market, such as the different tax policies and fluctuation in exchange rates, so that the combination of assets will change in response. Thus the cost of capital will be influence by both the change in market return rate and the debt equity ratio.

3.2.1.2.2 Fama-French Three-Factor Model

In addition, the further development of CAPM has been undertaking ever after it is launched out. Here are several other approaches to estimate the cost of equity, since CAPM has been considered as limiting all the risk with the market risk premium that is not sufficient to reveal the risk of investment in one stock. So the second approach is developed as a multi-factor model, other than condense all the risk in to one beta in the CAPM, and it is the Fama-French Three-Factor Model. In this approach, the chosen macroeconomic factors are variables that on past evidence seem to predict average returns well and therefore may be capturing in risk premiums. At the same time, we do not need to worry about the problem of measuring the market portfolio in the CAPM. As it is called, three factors are chosen in the Fama-French Three-Factor Model and respectively they are the Market factor, Size factor, and Book-to-market factor. In addition, the Market factor is measured by the return on market index minus risk-free interest rate; the Size factor is measured by return on small-firm stocks minus return on large-firm stocks; and the Book-to-market factor is measured by return on high book-to market-ratio stocks less return on low book-to-market-ratio stocks. Thus each of the factors is a kind of risk premium.

Furthermore, the Size factor and Book-to-market factor are the firm-characteristic variables, and they are chosen because of long-standing observations that corporate capitalization (firm size) and book-to market ratio predict deviations of average stock returns from levels consistent with the CAPM. Fama and French justify this model on empirical grounds: While Size factor and Book-to-market factor are not themselves obvious candidates for relevant risk factors, the argument is that these variables may proxy for yet-unknown more fundamental variables. (Bodie et al. 2011)

So the equation of equity return can be written as following:

$$r_E - r_f = b_E \cdot (r_m - r_f) + s_E \cdot (r_{Small} - r_{Big}) + h_E \cdot (r_{HighB/M\ Ratio} - r_{LowB/M\ Ratio})$$

After the factors of the model are identified, estimating the risk premium for each factor is the second step of the Fama-French Three-Factor Model. The main method is to take the mean of the historical data. Market factor is the average value of the difference between historical market return rates, such as the stock index margins, and historical risk-free interests, such as the interest rate of government bonds, in the same period of time. And the same to the Size factor, but the standard of sorting the big company and small company is a skeptical process. Since it is the measure of capitalization, we can put the companies into the categories of big, medium, and small by the market values of them. Following the grouping, taking average return rate of each group of companies is only a mathematic work. To keep the figures comparable, the best way is to collect size factor data in the same period of the market factor data even though the size of the companies may change. And the last one is the book-to-market ratio factor. As we have argued on the size factor, the book-to-market factor can be processed in the same way. Firstly group the companies into three categories as high book-to-market ratio companies, medium book-to-market ratio companies, and low book-to-market ration companies. With the same concern, we should have the data from the same time period to keep the figures applicable. Finally all these three factors got their values from the historical data, and we will use the data on predicting, of course with relevant tests on its validity and accuracy.

The third step in the Fama-French Three-Factor Model is to estimate the Factor Sensitivities. Normally, the sensitivities are calculated in industries, but the same method can be used to calculate in individual companies as well. We can implement linear regression on finding out the factor sensitivities. Meanwhile, using the data from the same period of time for regression is the important in this part of calculation as well.

To test the three-factor model, we can use the statistic methods on the equation. Most of the time, we can test the regression coefficients with Student’s T-test and calculate the R-square. The Student’s T-test will tell if the coefficient is significantly from zero and R-square will show how much interpretational power the equation has on the population.

$$R^2 = 1 - \frac{Residual\ Sum\ of\ Squares}{Total\ Sum\ of\ Squares}$$

Residual Sum of Squares is the sum of squared values of difference between the real values of risk premium and predicted values of risk premium from the model. And Total Sum of Squares is the sum of squared values of difference between the real values of risk premium and the mean of the real values of risk premium observed. So the R-square value is higher means the less residual element influences the interpretation, i.e. the better fitness of the model to the reality. And in the research, we use the Adjusted R-Square, which punishes the measure of fit if more regressors are added in the regression.

Since Davis, Fama, and French have tested the three-factor model with over 816 months between 1929 and 1997 by t-statistics and R-square statistics and found out those three factors contribute significantly to explanatory power (Fama et al. 2000), we can take the Fama-French Three-Factor Model as a valid method for calculating the cost equity.

3.2.1.2.3 The Momentum

However, the Three-Factor Model still has limit to evaluate the abnormal performance of a stock portfolio and a Fourth Factor, Momentum, was argued by Narasimhan Jegadeesh, Sheridan Titman, and Mark M. Carhart. At the beginning, Jegadeesh and Titman uncovered this momentum property of stocks, a tendency for good or bad performance of stocks to persist over several months in their article of Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency on Journal of Finance in 1993. And Carhart added this momentum effect to the Fama-French Three-Factor Model as a tool to evaluate mutual fund performance and the model became a common four-factor model. The finding shows that this momentum property is caused by the mutual funds' loadings or sensitivities (Mark M. Carhart 1997). But having one more factor on the model would make it even harder to explain

the changes in the risk premium of equity. So that more studies on asset pricing show the interest in the importance of liquidity and particularly an illiquidity premium.

3.2.1.2.4 Liquidity

The liquidity of an asset is the ease and speed with which it can be sold at fair market value (Bodie, et al. 2011). So the liquidity consists of the cost of engaging in a transaction, such as the bid-ask spread, and the price impact that the adverse movement in price one would encounter when attempting to execute a large trade. Moreover, immediacy is another component of liquidity, which is the ability to sell the asset quickly without reverting to fire-sale prices. Therefore cash is usually recognized as having the highest liquidity but small-cap stocks have very low liquidity. On the contrary, illiquidity would be measured how much discount from fair market value a seller mush accept when the asset needs to be sold quickly. In the models we argued above, the transactions are considered as costless. But the illiquidity shows that the cost of transactions and the larger the transaction is, the more illiquidity cost may apply. We can take the example from Bodie, Kane & Marcus: Consider a security with a bid-ask spread of 1%. Suppose it will change hands once a year for the next 3 years and then will be held forever by the third buyer. For the last trade, the investor will pay for the security 99.5% or 0.995 of its fair price; the price is reduced by half the spread that will be incurred when the stock is sold. The second buyer knowing the security will be sold a year later for 0.995 of fair value, and having to absorb half the spread upon purchase, will be willing to pay 0.995 – 0.005/1.05 = 0.9902 (i.e., 99.02% of fair value), if the spread from fair value is discounted at a rate of 5%. Finally, the current buyer, knowing the loss next year, when the stock will be sold for 0.9902 of fair value (a discount of 0.0098), will pay for the security only 0.995 – 0.0098/1.05 = 0.9857. Thus the discount has ballooned from 0.5% to 1.43%. In other words, the present values of all three future trading costs (spreads) are discounted into the current price. To extend this logic, if the security will be traded once a year forever, its current illiquidity cost will equal immediate cost plus the present value of a perpetuity of 0.5%. At an annual discount rate of 5%, this sum equals 0.005 + 0.005/0.05 = 0.105, or 10.5%! Obviously,

liquidity is of potentially large value and should not be ignored in deriving the equilibrium value of securities.

Example is very simple in logic showing; however, in the reality the liquidity embodies several characteristics such as trading costs, ease of sale, necessary price concessions to effect a quick transaction, market depth, and price predictability. So that measuring liquidity in with a single statistic is very difficult. Usually people measure the liquidity or, in fact, the illiquidity with the price impact which means the price concession a seller might have to offer to accomplish a large sale of an asset or what premium a buyer would like to make a large purchase of the asset.

In 2002, Yakov Amihud gave a measure equation of the illiquidity on Journal of Financial Markets. The measure of illiquidity is based on the price impact per dollar of transactions in the stock and can be used to estimate both liquidity cost and liquidity risk. And the equation is:

$$\boldsymbol{ILLIQ = Monthly\ average\ of\ daily\ \left[\frac{Absolute\ value(Stock\ return)}{Dollar\ Volume}\right]}$$

Acharya and Pedersen use Amihud's measure to test for price effects associated with the average level of illiquidity as well as a liquidity risk premium and found out that expected equity returns depend on the average level of illiquidity (V. V. Acharya and L. H. Pedersen, 2005). So that it will be more practical to add liquidity effects to the conventional Capital Asset Pricing Models we argued above and increase the explanatory power to the expected value cost of equity.

3.2.1.2.5 Perfect Market

Another factor in the market we have to consider is the market condition, which is whether the market is a perfect market or out of perfect market. This is the fitness between the assumptions in CAPM or in any of the further developed models and the real market condition.

A perfect market is characterized by its perfect competition in the market, and it has the basic conditions of perfect market information, all participants in the market at price takers, no barriers to entry or exit, and equal technological advantage (N. Gregory Mankiw, 2009).

Under the assumption of perfect competition, a market will reach equilibrium in which supply for every product or service, including labor, equals demand at the current price. And this means nobody can be made better off by exchange without making someone else worse off, i.e. no one can beat the market (Gerard Debreu, 1972). As introduced before, theoretically share and foreign exchange markets are commonly recognized the closest to the perfect market. But some of the government impacts cannot be ignored, such as the foreign exchange regulation in China.

3.2.1.2.6 Summarize

From a single risk estimator in CAPM, researchers developed the Fama-French Three-Factor Model; moreover, the momentum was considered to add onto Three-Factor Model and turned to be Four-Factor Model; furthermore, after the financial crisis, liquidity has been recognized as another important factor that influences the price of equity. This is an evolution of theories in estimating the cost of equity, and in the practice, when selecting the model, researchers are not only focusing on the fitness of the model but also considering the best match to the research topics.

3.2.1.3 WACC

After the cost of debt and cost of equity are calculated, this part shows how they are integrated into the cost of capital. The most common approach to calculate the cost of capital is Weighted-Average Cost of Capital (WACC). Since the cost of capital estimated as a blend of the cost of debt and the cost of equity, the WACC can be calculated mathematically as follows:

$$\textbf{WACC} = \boldsymbol{r_d} \cdot \frac{\boldsymbol{D}}{\boldsymbol{V}} + \boldsymbol{r_e} \cdot \frac{\boldsymbol{E}}{\boldsymbol{V}}$$

In the WACC, the value of debt (D) and equity (E) add up to overall value of the firm's asset value (V). And in the calculation we will use the figures of all market values instead of book, accounting, values. Moreover, the expected return of the debt, i.e. the interest rate is r_d and the expected return of the equity is r_e. The overall cost of capital is a logic combination of the cost of each type of the assets in the portfolio.

And the WACC has three assumptions. The first is that new projects have the same risk-return profile as the company's existing activities; and the second is that each project is marginal to the scale of existing operations; and thirdly, WACC assumes the company will retain its existing capital structure, leaving financial risk unchanged (Alan Hill, 2008). These three assumptions of WACC mainly focus on the stable capital structure of the firms and the return rates are unchanged with adding in new investment projects.

Nevertheless we need to consider the role of the government in the market, since some tax will have impact on the weights of the equation. For example, the debts are tax-deductible expenses for corporations. So the after-tax cost of debt is $(1 - T_c) \cdot r_D$, where T_c is the marginal corporate tax rate. So that the after-tax WACC is:

$$\textbf{After-tax WACC} = (\boldsymbol{1 - T_c}) \cdot \boldsymbol{r_d} \cdot \frac{\boldsymbol{D}}{\boldsymbol{V}} + \boldsymbol{r_e} \cdot \frac{\boldsymbol{E}}{\boldsymbol{V}}$$

Finally the calculation of after-tax WACC can be more realistic.
In addition, it is clear that the taxation policy difference in Norway and China would be another big issue we can make strategies on.

3.2.2 Financing Expenses

Beside Cost of Capital, there is another part of financing costs that is financing expenses. And this is the amendment of the unrealistic Assumption 4 in the CAPM, which assumes there is no transaction cost on trading securities.

The financing expenses include financing fees, such as Initial Public Offering (IPO) expenses, which are IPO underwriting fees (generally 5% to 7% of the gross proceeds), fees related to legal and accounting advisors, and printing costs, moreover, there are other fees such as the Security and Exchange Commission (SEC) filing fee, the exchange listing fee, and any Blue Sky filing fees. In different countries, there are different accounting standards that means paying professional local accounting and auditing services is inevitable, especially the firm needs to get financed from the stock market. With the same logic, the regulatory commissions charge different fees and different stock exchanges ask for different listing fees and filing fees. These are the reasons for variety of financing expenses in the stock markets. However, the financing expenses are short-term expenses, in the long-run they are either die out or transferred to the investors (Yingmei Guo, 2011), and the financing costs are barely influenced by the financing expenses.

Besides financing fees, security transaction taxes are included in financing expenses as well, such as the Stamp Duty, which is taxed at certain percent of the contract trade value. But the taxes on securities are applied differently in the world, such as Stamp Duty is abandoned in some countries like USA, Japan, Singapore, Germany, Sweden, Finland, but still in use in some countries like China, UK, India (BIS, 2011). In Norway, there is no financial transaction tax being levied (Marion G. Wrobel, 1996).

3.3 Summary

This chapter introduced theories and models of financing cost. In the cost of capital part, theories and calculation of the cost of debt are argued firstly. Following that,

CAPM and its derivative models, which are used to calculate cost of equity, are argued in details with their basic assumptions and mathematical processes. WACC is introduced as the model to sum up of two components of cost of capital.

In addition to the cost of capital, this chapter gives a brief argument on the financing expenses, which are usually paid to the financial institutions and government for the shares getting listed in the exchange and the securities trading publicly.

The theories and models provided the fundamental basis of analyzing the financing cost of the firms in the market. Correctly implementing these theories and models guarantees the precision and validity of all the analyses in this research.

4. Methodology

4.1 Introduction

As a research, having a clear view of the methodology that it is based on is very important in letting the readers understand why and how the researcher analyzed the data and gave out the conclusion.

Methodology can be described as a system of explicit rules and procedures of techniques used to enquire into a specific situation, upon which research is based and against which claims of knowledge are evaluated (Mark Easterby-Smith et al. 2008). Furthermore, it guarantees the knowledge we got from the research is logical to the researchers as well since it provides a sense of direction for the author to complete framework as well as the methods used, it also provides a guideline to research and gives focus and answer to the objectives. Nevertheless, there are neither good nor bad methodologies in the research, but more adequate ones to the topic and condition of the specific research. Therefore the methods are assessed by whether they are suitable in acquiring the problem or not, such as the quantitative methods and qualitative methods.

In this research, both quantitative methods and qualitative methods, mostly quantitative methods, will be implemented under the regime of basic economy theories. As the epistemology leads to the relevant methodology in the research, so the historical financial data and interview reports are the main resources of empirical data; with the help of computer software, the research will find the average financing cost in China and Norway, and at the same time, give out the structure of the cost of capital which would be helpful to make optimal business strategies for Norwegian companies to operate business in China. This type of research philosophy can be understood as pragmatism, since we believe there are no pre-determined theories or frameworks that shape knowledge and understanding (Mark Easterby-Smith, et al. 2008). In the study we do not take any form of financial structure or financing resource dominates another also we do not seek a universal law to the social phenomenon, such as the best financial system. However, we will find out the

correlation between the different factors, for example, the either market-based financial system or bank-based financial system, protection to the investors, and different financing costs. Despite the outcome, the research would have interpretation from probability instead of verification or falsification processes. All the data would be treated as a sample with the normal distribution; the analysis would be tested by the probability distribution. So that it can be said that the aim of the research is to expose the correlation between financial markets' factors and financing costs by the support of high probability of its existence. Throughout the whole process of learning this correlation, it takes place as a continual movement from concrete experience, to reflective observation, to abstract conceptualization, to active experimentation and back to concrete experience, which is known as the Kolb Learning Cycle (Johnson & Duberley, 2000).

The advantage of the implementing Pragmatism in this research is that this paper is not a causality analysis like the Positivism research but a correlation exposure, so that the methodology comes with Pragmatism is much more suitable to the research. Pragmatism has the equal emphasis on both quantitative data and qualitative data in the studying and understanding the phenomenon. Hence it will provide a better understanding of social factors rather than only abstracted numbers. And the most important idea in this research is to provide the strategies to Norwegian companies operating in China, which means the comparison in the numbers of financing cost is just a basement of the study but the key finding is the "soft-understanding" of the financial structure and financial system in China, what we call social factors in research. Pragmatism can be the most applicable epistemology in this social science research.

4.2 Choice of Research Design

There are quite a few options for research design, and they provide variety of ways in organizing research activities that accomplish the research. The research design marks

out the methods implemented in the research and the collection of data (Mark Easterby-Smith, et al. 2008). As the research design is made to achieve the research aims, there are many factors influencing the designing and implementing processes. Such as the most important factor, the topic of the study, filter out many scheme of the research design at the very beginning. As well as the type of accessible data will give the boundary of the selection of research methods.

As a study of financing cost, this thesis will mainly base on the financial statistics, and then supported by interview reports, and relevant news on financial operations. The financial statistic figures are the most exploratory elements in this thesis

4.2.1 Qualitative Methods or Quantitative Methods

This thesis aims at calculating the financing costs, and it is a complex regarding to its components, which relate to government regulation, cost of capital, taxation policies, type of financial system, and financial institutions, etc. According to the research topic, most of the data collection methods are secondary data collection methods. Moreover, the quantitative methods are widely implemented in processing data regarding to characteristics of the data.

Qualitative methods are commonly grouped into method of interview, observation, and diary (Esterby-Smith et al. 2008), and they are mostly used as the techniques of interpreting, describing, decoding, translating and otherwise making terms of meanings, but not acquiring frequency or amount in the social world phenomena occurrence (Van Maanen, 1983). But the study on financing costs is about the amount of capital return rates, IPO expenses, auditing costs and so on, which are mainly about the quantitative statistics in social activities. Obviously, the qualitative methods are not a good choice to cope with these tasks in research. On the other hand, the quantitative methods comply on experimental and statistical controls (Esterby-Smith et al. 2008), which are defining the feature of this research.

During this research, arguments are focused on the certain type of financial transaction costs that means the primary data collection methods are quite limited because of researcher's status and opportunities. However, as a feature of financial market, the deep disclosure of necessary information is very helpful to the research on those related topics. So this means the research chose the secondary database as the source of quantitative data, instead of through surveys and observational methods. With using this quantitative data collection method, secondary data that is collected from the public documents, announcements, news or interview reports, and statistic databases can be sufficient to examine the insights of financing costs thoroughly. Such as the annual reports, stock indices and bonds prices in online database from security exchange are the very fundamental resources of secondary data in this thesis. Among the reports from the exchanges, researcher can collect the stock prices, average market return rates, typical firms' capital structure, etc. Collecting data from the statistics published by government ministries is another essential method to obtain the national perspective of international investments in the country. The publications from central banks offer the structure of ownership of financial assets, international investment data and important figures in macro-economy, and so on.

Along with the research topic and specific data feature, the researcher chose the quantitative data methods. And, as Mark Esaterby-Smith (2008) said, "the task of the researcher is to interpret the data recorded in a secondary data archive in terms of particular study objectives".

4.3 Data Collection

As the brief argument above, the data collection in this thesis consists of secondary data. And it can be categorized into financial market data, government publications, and news reports.

4.3.1 Financial Market Data Collection

The empirical part of this thesis is mainly based on the secondary data from financial market databases and publications. The data, which includes annual reports of the listed companies, bond return rates, stock indices, is collected from the websites of Shanghai Security Exchange, and Oslo Børs Exchange. And the annual reports from the Big Four audit firms, PwC (PricewaterhouseCoopers), Deloitte Touche Tohmatsu, Ernst & Young, and KPMG, are another very important data collecting resource in this research. As well as the banks websites that provide the bank loan interest rates are taken as data collecting targets.

The study of financing cost means the researcher has to sum up the all the components of it, thus the cost of capital, financing expenses of the firm are calculated. The share price data has to be collected from the stock market database; the bonds return rates need to be obtained from the bonds market database; bank loans are another part of corporations' debt financing, and its interest rates are announced on banks' websites. So the collection of data for calculating cost of capital consist of the access of databases of Shanghai Security Exchange, Oslo Børs Exchange for information of firm's equities, and the annual reports from these two exchanges that provides the capital structure of listed firms, the market return rates, total trading data for a whole year and so on, also the websites of the commercial banks are a part of the data collection to the cost of capital for bank loan interest rates. And the annual reports from auditing firms are very illustrative of the overall IPO expenses, in which this research collects the financing expenses data.

In a list, the research collected the data from:

1. Shanghai Stock Exchange Statistics Annual
2. Market Details from Shanghai Stock Exchange
3. Shanghai Stock Exchange Website
4. Oslo Børs Annual Statistics
5. People's Bank of China Website
6. Norges Bank Website

7. Reports from PwC, Deloitte Touche Tohmatsu, Ernst & Young, and KPMG

4.3.2 Government Publications

All the financial activities are conducted within the government regulations, so that the government publications, especially in the taxation policies, are essential part of data collection.

In China, the Ministry of Commerce of the People's Republic of China releases the foreign investment statistics and taxation policies on its website or in its publications. And in Norway, the Ministry of Finance discloses international investment data and the government regulations on financial market and taxation policies on its website. These archival data collected to calculate the financing expenses and tax-deductible expenses in the WACC.

4.3.3 News Reports

The mass media have their special perspectives in the business nowadays, and the analyses from news reports are very valuable resource to understand the situation and policies in the financial market. The news reports reveal the practical rules in the market, and sometime unspoken secrets in the business activities.

Reading the news reports and collecting the up-to-date business operation data is used as proofs to the data from other resources in this research. Some interviews with economists in China are reported in the news and released in-depth understanding of the market situation. The same in Norway, DN.no has a lot of analyses on the investment environment in Norway that are helpful to know the real costs in some financial activities.

4.4 Evaluation of Data

Since the data are collected secondarily, the evaluation of data is focused on validity and reliability of data.

4.4.1 Validity

The validity is how closely the data correspond to reality, and it is a matter of whether a sufficient data is observed. And it has two aspects that are internal validity, which is related to bias of data, and external validity, which concerns about how generalized the result is. (Easterby-Smith et al. 2008)

In this thesis, internal validity and external validity are evenly emphasized. To increase the validity, large sample and more evidence resources should be used to eliminate bias of data. And the bias measures how far the selected data, the sample, is different from the market trends, the population (Chris Brooks, 2008). And this is a concern from statistical methods when the data collection is done secondarily. Such as the stock index SSE 50 can be considered as a biased sample comparing with SSE Composite Index because SSE 50 only represent big companies with high corporate values and good operational conditions (SSE, 2012). However, the data bias is a relative matter, as when the research is about the big companies in China, the SSE 50 is a better data sample. In this research, the data are collected in variety of scales according to the specific problem argued, and this method will give a higher validity. And the other aspect is the evaluation of the news reports or interview reports that are used as secondary data. Theoretically, all types of perspectives can be shown on mass media, but the quality of these reports should be evaluated. The technique is to examine multiple evidence sources on the identical topic. And the comparison and proven between multiple evidences provide a higher validity in this research, such as

the annual statistics from Shanghai Stock Exchange and the annual reports from PwC can confirm the IPO expenses rather than only either of them.

4.4.2 Reliability

Reliability measures if the same result will be reached in other occasions, i.e. the stability of the research result (Easterby-Smith et al. 2008).

In order to have a high reliability in the research, the process of collecting data and processing data should be standardized and accomplished in the most universal way. The resources of data should be authorized and open, so, in this thesis, all the data are obtained from the official websites and online database of financial institutes, as well as the news reports are from mature international media, such as Financial Times and Phoenix New Media. Moreover, the models used in the research have been proven by previous studies in financial research. The calculation is done with the valid data and the statistic tests are performed.

5. Empirical Part

5.1 Introduction

The goal of this thesis is revealing the Chinese market to Norwegian investors, and majority of the empirical introductions focus on the circumstances in China; meanwhile, the comparison with Norwegian market serves as a tool to understand the situation comprehensively.

The empirical chapter starts with the systematic introduction of financial facts in China and Norway. This part consists of financial system in China, financial system in Norway, companies' financing resources China, and companies' financing resources in Norway. And these analyses and rankings are done with relevant empirical data collected from both countries that would provide convincible foundation.

Selecting the model in calculating the cost of capital is corresponding to practical concerns as it is stated at the summarize of cost of capital part, which means financial situation in both countries offers the relevance of selecting CAPM, and this topic will be argued in the second part of this chapter.

Following the settlement of CAPM, the third part of empirical chapter states the calculation processes and results of cost of capital in China and Norway. The empirical data from databases in banks, stock exchanges, and bonds markets will be integrated and computed according to the chosen methodologies. Related statistic tests are performed in this part as well.

The last part mainly introduces the financing expenses for the firms in China and Norway. Thus, this is a very social activity relevant part. As argued before, the share and foreign exchange market are closest to the perfect market; however, the financing expenses consist of the transaction costs that out of the perfect market, especially in a market with an authoritarian government like China. So this is always recognized as a cultural barrier for international investors in China. The researcher gives interpretation

of news reports and related data on this topic with a native understanding and comparative arguments between two countries.

5.2 Financial System in China

The modern financial system in China is enlightened by western regime follows China's opening up from 1978. There are several milestones on the evolution of Chinese financial system: 1979, the reform of Chinese financial system has been started by the leader Deng Xiaoping; 1983, Central Government of China assigned the People's Bank of China as the central bank[1], which is regulating the financial market and out of commercial operations, and from January 1st, 1993, People's Bank of China has fully transformed, and since 1995, started legally functioning as the central bank in China[2]; in December1990 and April 1991, Chinese stock exchanges are founded in Shanghai and Shenzhen; from April 1997, the bonds market has been formally formed (Yifu Lin et al. April 2000); in 2001, China joined the WTO with conditions of opening up the financial market to the world.

As it is shown above, all the reform are aiming at building up a western standard financial system, which has a central bank monitoring the macroeconomic indicators, and making and implementing financial policies. At the same time, share market and bonds market along with commercial banks provide financings in the country's capital market. However, the sophisticated derivatives instruments are not available in Chinese capital market now (Country Finance. China, August 2011), and the highly expected opening-up in Chinese capital market, a requirement of accession to WTO, is at a little bit disappointing pace because the foreign financial institutions are limited in their services or the investing method[3]. For example, in the banking industry, at the end of 2011, there were only 35 locally incorporated banks and 45 foreign bank

[1] State Council of China, *Decision of PBC Function as the Central Bank of China*, September 1983.
[2] National Congress, Law of People's Bank of China of P.R.C., March 18th, 1995
[3] http://www.mof.gov.cn

branches approved to operate business in RMB, the currency in China, 25 locally incorporated foreign banks and 25 foreign bank branches authorized to engage in derivative transactions, and 5 locally incorporated foreign banks authorized to issue RMB financial bonds.

Table 5.1 **Foreign Banking Institutions in China (Number of banks)**

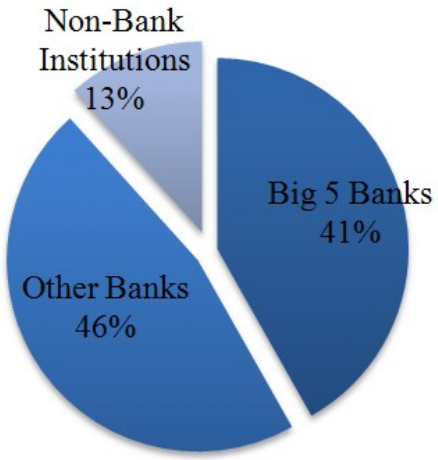
	Foreign banks	Wholly foreign-owned banks	Joint-venture banks	Wholly foreign-owned finance companies	Total
Locally incorporated institutions (LII)		37	2	1	40
LII branches and subsidiaries		245	8		253
Foreign bank branches	94				94
Total	94	282	10	1	387

*Source: China Banking Regulatory Commission Annual Report 2011, various.

But these banking institutions share very little of the banking assets in China, 387 foreign institutions totally hold RMB 2.15 trillion and it is only 1.93% of the total banking assets in China, even though all of these banking institutions have better risk management performance, which is measured by several key indicators, than the Chinese banks.

This slow opening up example can imply one feature of Chinese financial system that is the banks are the dominating the market. The 2011 Annual Report of China Banking Regulatory Commission stated that at the end of 2011, the total banking assets in China reached RMB 113.28 trillion, approximately USD 17.96 trillion, and the national financial asset value is around RMB 130 trillion, and this means the banks holds around 87% of all the financial assets in China. Moreover, the five big national banks, Bank of China, China Construction Bank, Agricultural Bank of China, and Bank of Communications, hold up to RMB 53.63 trillion out of the 113.28 trillion banking assets, 41% of all financial assets in China (See figure 1).

Figure 1: Relative Holdings of Financial Assets in China, 2011



*Data Source: China Banking Regulatory Commission Annual Report 2011, various.

What indicates from this concentration of financial assets in the banking system is that the central government has absolute control of this sector. And this has been a persistent phenomenon in China for years, which can be shown in the table 5.2.

5.2 **Relative holding of financial assets in China**

Financial Institution	RMB trillion				USD trillion
	2007	**2008**	**2009**	**2010**	**2010**
People's Bank of China (Central Bank)	16.91	20.70	22.75	25.93	4.11
Banks	52.6	62.39	79.51	95.30	15.10
Security Companies	4.98	1.19	2.03	1.97	0.31
Insurance Companies	2.90	3.34	4.06	5.05	0.80
	77.39	87.62	108.35	128.25	20.32

*Source: PBOC Financial Stability Report 2011, various.

*Note: Security Companies includes brokerages and fun-management companies.

The dominance of banks in Chinese financial system confirms a bank-based financial system in China as we argued in Chapter 2. This type of financial system has its advantage like better short-term difficulty solvency but disadvantage, such as hard for new and small firms to obtain financing.

After years of development, Chinese capital market tends to be mature gradually. There are varieties of financial institutions in the market, banks, security exchange, insurance companies, mutual funds, and trust companies. The Shanghai Stock Exchange is the main stock exchange in China, till the end of 2011, there are 931 companies, 975 stocks listed in SSE, with total turnover of RMB 14.84 trillion. The SSE provides bonds transactions as well, and in 2010, the total turnover of bonds market in SSE is RMB 7491.443 billion. According to regulation from the China Security Regulation Commission, in Chinese stocks, there are A Share, B Share, and H Share. A Share is the stock that are priced and traded in Chinese currency, RMB; B Share is the stock priced in RMB but traded with foreign currency that used to allow only the foreign investors invest in Chinese stocks, but now, everyone can buy B share with foreign currency; H Share is special, it is the stock listed in Hong Kong but the company is registered in Mainland of China, so that H Share is a type of international financing for the companies in China. The stock market is segmented into different types of shares, and there are a lot of SSE indices as well. SSE indices are the authoritative statistical indices widely used as measures of Chinese securities market performance, and they are SSE Composite Index, SSE A Share Index, SSE B Share Index, SSE Sector Classification Indices, SSE 50 Index, and so on. The study of Chinese stock financing has to involve many of these indices later. As introduced above, SSE operates bonds as well. By the end of April 2012, there are 732 bonds listed in SSE, among them, there are 137 T-bonds, 54 local treasury bonds, 357 financial institution bonds, 127 corporate bonds, 14 convertible bonds, and 15 separately traded convertible bonds.

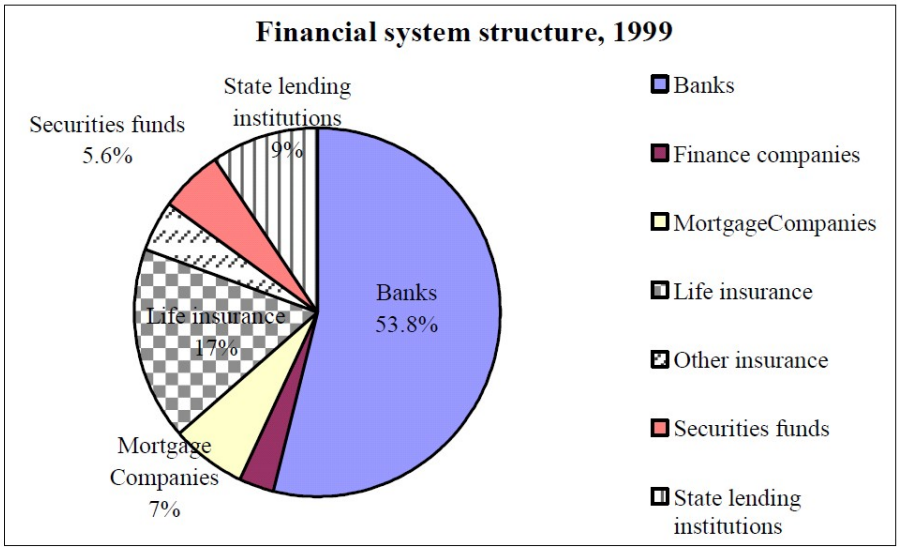
Because of the speed transforming from a planned economy, some problems have shown up. Such as the insider trading in Chinese share market is no longer a piece of news, absence of bank loan risk management, governmental impact over market, and etc. (Larry H. P. Lang, 2010). Nevertheless, in Chinese capital market, after all, there are much more options for firms to get financed than ever before.

5.3 Financial System in Norway

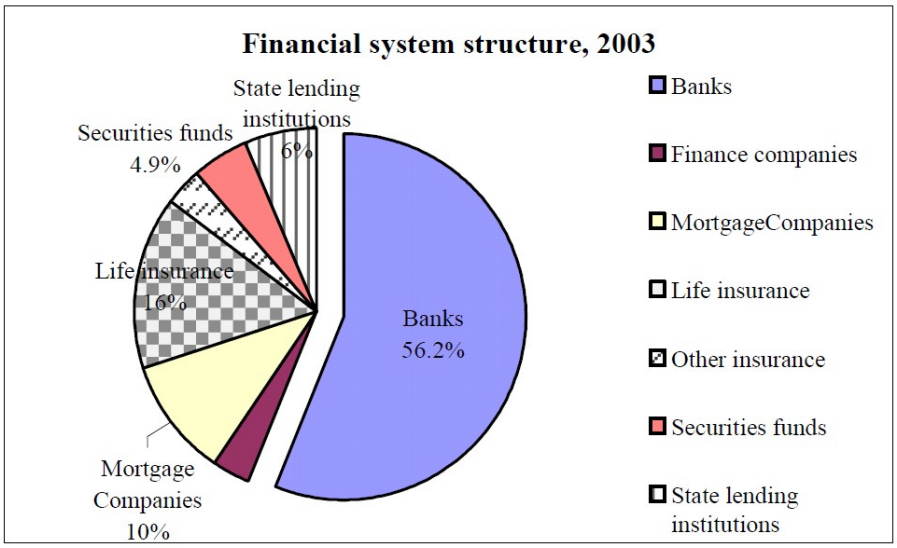
The Norges Bank and the Oslo Stock Exchange are two main components for Norway's financial systems strength (International Business Wiki 2010), which are the central bank of Norway, Norges Bank, and the main stock exchange, Oslo Børs Stock Exchange.

The financial system in Norway can be also marked as a bank-based financial market since the banks are still controlling the major part of the financial assets in the market. The figure from Norges Bank shows the structure of asset holing in Norway, 53.8% of the financial assets are hold by the banks in 1999 and 56.2% of the financial assets are hold by the banks in 2003 (See Figure 2). At the end of 2011, the banks is holding NOK 3,950 billion out of the total NOK 6,979 billion financial assets in the country, which take up 56.6% as well[4]. This is not very different from Chinese financial market structure. But the banks in Norway have well developed risk management and they are better-capitalized compare with European banks as well (Norges Bank Financial Stability Report, No. 2-2012).

Figure 2: **Share in Percent of Total Financial Sector Asset**



[4] Norges



*Source: Financial Stability Report, Norges Bank

5.4 Companies' Financing Resources in China

In China, after years of developments in financial market, there are several ways for the companies to get funded:

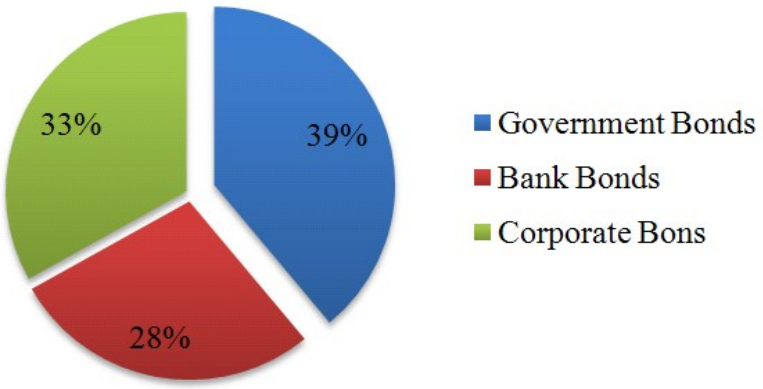
1. Public offering shares in stock exchange;
2. Issuing corporate bonds;
3. Obtaining bank loans.

From the statistics, during 2010, in Shanghai Stock Exchange and Shenzhen Stock Exchange, daily average trading volume is RMB 225.4 billion, and totally 531 companies conducted their IPO in A Share market, the share traded with RMB only, and the equity and debt financing value reached RMB 1,027.52 billion, including the share financing value RMB 967.23 billion.

The bonds market in China can be described as captive, the financing value from bond market has overtaken the stock market ever since 2005, and in 2010, the bond market

provided approximately RMB 2 trillion, and it shares 77% of overall direct financing value in China. However, the bonds market consists of a giant government bonds group and, of course, the corporate bonds. Among all the bonds in the market at the end of 2010, there are RMB 1,977.8 billion government bonds; and the corporate debts is RMB 1,681.2 billion, which include short-term financing bills, RMB 674.2 billion, medium-term notes, RMB 492.4 billion, and corporate bonds, RMB 60.3 billion; the rest are bank bonds, RMB 1,412.3 billion[5]. Therefore, the bonds market in China a main financing resource of the government, instead of the firms (See Figure 3).

Figure 3. Components of Chinese Bond Market, 2010



*Source: PBOC Financial Stability Report 2011, various.

The bank loans are the main financing resource to the companies in China, in 2011, the loans amount to RMB 41,038.67 billion[6], which is 29 times of the corporate debts in bond market. From 1994 till 2010, the percentage of financing value from stock market against bank loan increasing volume has never exceed 25%, even barely over 10% in most of the years (See Table 5.3). And before 2005, even though government bonds are included, the bond market had smaller financing capacity than stock market. This means the bank loans in China have been the core of the corporation financing.

[5] PBOC Financial Stability Report 2011:65, various.

[6] PBOC, Sources & Uses of Credit Funds of Financial Institutions (by Sectors) 2011. http://www.pbc.gov.cn/publish/html/2011s03a.htm

So the bank loan interest rates are very influential to the corporate daily financing, thus, the benchmark interest rate in China is a key figure in studying of cost of capital.

Table 5.3 **Domestic Stock Financing Value and Bank Loan Increase Value Ratio**

Unit: billion RMB, %

Year	Domestic Stock Financing Value	Bank Loan Increase Value	Ratio
1994	13.81	721.66	1.91
1995	11.89	933.98	1.27
1996	34.15	1068.33	3.20
1997	93.34	1071.25	8.72
1998	80.36	1149.09	6.99
1999	89.74	1084.64	8.27
2000	154.10	1334.66	11.55
2001	118.21	1243.94	9.50
2002	77.98	1897.92	4.11
2003	82.31	2770.23	2.97
2004	86.27	1920.16	4.49
2005	33.81	1649.26	2.05
2006	123.19	3144.13	3.92
2007	843.19	3632.25	23.21
2008	330.82	4985.40	6.64
2009	392.35	9629.02	4.07
2010	967.22	7951.07	12.16

*Note: Domestic Stock Financing Value includes A Share and B Share

*Data Source: PBOC and CSRC

Because of lack of risk management in Chinese banks, the evaluation of business projects is a long process, and the bank loans are very concentrated to SOEs policy loans and real estate, and moreover the credit limit is relatively small to private sectors[7]. As a special feature of Chinese financial market, that is, the SOEs are the favorite financing target of banks, i.e. the majority of bank loans are granted to the

[7] PBOC Financial Stability Report 2011:27, various.

SOEs. SOEs in China have special market power such as monopolies in some industries and governmental backup when the financial condition of them becomes bad, because the state government owns the enterprises and the same government owns the banks as well. Furthermore, historically, there is political impact on this as well (Walter & Howie, 2011), the bank loans to SOE take over the place of national subsidies in the past. So the scenario is that the bank loan interest rate seems low, but not always available to all the firms in the country. This is a disadvantage of bank-based financial market, which regards the small or new business as high-risk investment from banks' vision.

5.5 Companies' Financing Resources in Norway

Even though the financial system in Norway is denoted as a bank-based financial system, the stock market and bond market are functioning well in the country. As the same, there are three financing resources in Norway: the stock market financing, bond market financing, and bank loans.

The stock market in Norway is strong growing throughout international markets, and it is one of the most mature stock market in the world. And from the figures provided by Oslo Børs, the trading in the market is very active as well, only in October 2011, Statoil has the trading NOK 25,347.2 million with the overall turnover 21.34%. In the same month, the market capital of all issuers is NOK 1,561 billion in Oslo Børs and NOK 18.8 billion in Oslo Axess. And constantly there are big international companies joining in the market. The high information transparency and sound governance of the companies listed provide much better investor's protection comparing with Chinese stock markets. As Norwegian stock market is very open to the world, there is very high percentage of the investment from foreign countries; meanwhile, it has strong response from worldwide financial decline. Also it has strong ties to oil driven economy in Norway since we can see the key role that Statoil is playing in the market.

The fund raising capacity of Oslo Børs is very high, in 2011, the issue volume hit NOK 32,749 million, and in 2010, it is NOK 59,709 million[8].

The Norwegian market for corporate bonds is small, in 2011 there were 702 bonds issued in a whole yare, among them, only 67 bonds are issued by industry corporations[9]. So few companies issue bonds compared with other countries in Europe, and the amount outstanding is usually relatively low. Moreover, turnover of most bonds is very low. Thus, few indices for corporate bonds can provide a continuous and satisfactory picture of developments in the corporate segment of the Norwegian bond market. This makes it difficult to determine which references are used in the corporate bond market (Ketil Johan Rakkestad, 2004). Moreover, banks are the largest borrowers in the corporate bond market, who take up NOK 52,752 million out of total increase value of bonds market, NOK 85,389 million, in 2011[8]. But at least, the bond market has a much more mature risk management system which we can derive the risk premium from it.

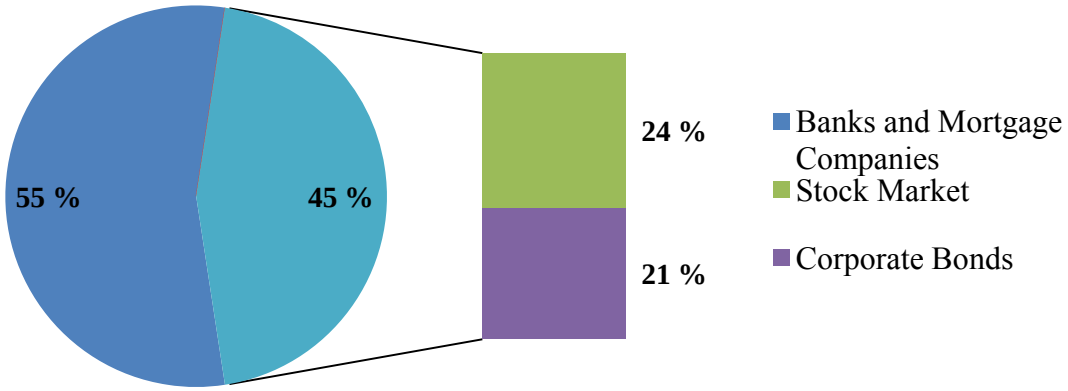
At the end of 2011, December 31, 2011, the market value of equities in Oslo Stock Exchange, Oslo Børs and Oslo Axess, is NOK 1,557 billion; the outstanding domestic bonds and short-term paper debt issued by private enterprises, public sector and state-owned companies respectively is NOK 100 billion and NOK 568 billion, totally NOK 668 billion; nevertheless, the 130 domestic banks lent out NOK 1,677 billion and 12 foreign bank branches lent out NOK 334 billion, overall, it reached NOK 2,011 billion, in addition, 30 mortgage companies, including branches of foreign companies, lent out NOK 1,616 billion, and corporate loans account for approximately 40% of total bank and mortgage company lending that is NOK 1,450.8 billion[4].

In 2011, the stock market raise up NOK 32,749 million; the bonds market obtained capital of NOK 27,565 million, which is summed up from both Oslo Børs Bond market and Oslo ABM (Alternative Bond Market); the increase of lending from banks and mortgage companies is NOK 183 billion, and 40% of it is granted to corporations

[8] Issues Statistic, Oslo Børs, May 2012
[4] Norges Bank, Financial Stability Report No.2-2012, May 2012
[8] Issues Statistic, Oslo Børs, May 2012
[9] ABM Statistic, Oslo Børs, May 2012

that is NOK 73,200 million[4]. This shows the dominance of bank loans in corporations' financing resources (See Figure 4).

Figure 4. Corporate Financing Structure in Norway, 2011



*Source: Norges Bank, Financial Stability Report, No.2-2012

5.6 Relevance of CAPM

According to the research topic of this thesis, the aim is to have an overview of the financing costs, therefore the estimation of cost of capital is part of the study and among it calculation of cost of equity is a component. The model selection of cost of equity should adjust to the overall research topic and the data of both countries' market situation, which means that the model needs to be illustrative and practical.

Only in Shanghai Stock Exchange, there are 940 listed companies with 984 listed stocks trading by May 15, 2012, which increased 9 companies and 9 stocks from the beginning of 2012; from SSE website, there are 11 more companies waiting for their IPO in the near future[10]. The structure of the capitalization changes every day, and comparing with the giant market volume, majority of the listed companies' individual

[10] www.sse.com.cn

turnover is relatively small. For example, on May 15, 2012, the daily transaction value is RMB 77.70 billion but the most traded individual stock accounts only RMB 3.3 billion, and this market feature indicates the individual factor of the company cannot stand out very much from the overall market performance, and this is confirmed by the speech of chairman of China Security Regulatory Commission, Shuqing Guo on March 1, 2012.

In Norway, the stock market is a operating in a small open economy (Gjerde et al. 2000), the investors are price-taker and have free entrance and exit; common investors can only invest in the publicly tradable assets. And the open capital market has strong pressure to restore equilibrium that eliminates the arbitrage (Bodie et al. 2011).

The share markets in these two countries are different, however Chinese stock market has huge market turnover that leaves the individual firms in strong competitions within the market, and Norwegian stock market has open environment that has strong external competitions. Both markets can be assumed as perfect markets where we can implement CAPM on estimating the cost of equity.

5.7 Cost of Capital in China

In the theoretical part, the researcher has explained the theories and models that would be implemented on the empirical data. So the cost of capital calculation on empirical data is performed with three steps, which are calculation of cost of equity with CAPM, cost of debts with weighted average, and the sum up of cost of capital with WACC.

In the calculation of cost of debts, each type of debt financing's return rate is weighted by the financing volume that financing instrument provides. This method will keep all the debt financing instruments' interest rate correctly estimated in overall cost of debts for the firms or for the market. Because the greater amount the debt financing instrument provides, the heavier its interest rate impacts.

5.7.1 Cost of Equities in China

The calculation of cost of equity in China is divided into two parts, national scale and economy sector scale. The national scale cost of equity is the overall stock return rate in China, and this is the investors' market return rate with the most diversified stock holding in the market. Therefore, this return rate can be used as a benchmark to the stock investment, which stands for the annual market return rate, r_M, in CAPM.

5.7.1.1 Market Return Rate

The market return rate in China is commonly calculated with the arithmetic mean value of SSE composite index return rates. Normally, the studies on stock return rate use the annual return rate calculated by comparing the closing price on last trading day. But these closing prices at the end of the year have their daily changes, and this specific day's variance influences heavily on the annual return rate. To absorb this unexpected impact in this research, we use recent 3 years, 2009 to 2011, daily return rates of SSE composite index closing prices, and obtain their arithmetic mean value then multiply the number of average annual stock trading days,$\frac{n}{3}$, to get the share market's annual return rate. Because the first day in the sample cannot obtain the daily return rate, the number of trading days in arithmetic average function should have been corrected by less one, $(n-1)$; but the calculation for the annual return rate with multiplying $\frac{n}{3}$ just automatically sets the first day with average daily return rate of the sample period. This is acceptable in the research. Explain mathematically,

$$\bar{R}_M = \frac{\sum_{i=1}^{n} r_i}{n-1}$$

$$r_M = \bar{R}_M \times \frac{n}{3}$$

Where $\bar{R}_M$ is the average daily market return rate

r_M is the annual market return rate

r_i is the return rate on day *i* (statistically *i* starts from 0)

n is the number of days the stocks are traded during the sample period

And finally, the annual return rate in Chinese stock market is 7.62%,$r_M = 7.62\%$, which we can take as r_M in CAPM for Chinese market in further calculation. In addition, the sample period, 3 years, only has 726 trading days for stocks in Shanghai Stock Exchange, and the annual return rate should be calculated with the number of trading days in order to avoid inflating the stock return rate. If the number of days were taken as 365, the stock market annual return rate would be mistaken as 11.49%.

5.7.1.2 Cost of Equity in Economy Sector

To the economy sector scale, the investment will become a portfolio, and the expected return rate can be calculated with CAPM. The variables are set bases on the SSE sector index of the certain economy sector, which selects out all the stocks of firms in that economy sector, and the SSE composite index, which represent all the stocks in SSE. The sensitivity coefficient β_k between the economy sector and the whole market is better to calculated with the daily data, which provide more data series rather than annual data.

The risk-free return rate in China is still not settled with a universal standard in academics, but in this thesis, we use the interest rate of the one-year Treasury bond listed in SSE with highest interest rate as the risk-free return rate. Because this is the most profitable single-period investment without risk in the country, and this complies with CAPM assumption of single-period investors and the opportunity cost theory as well. So the chosen T-Bond is Bond No.019120 that is issued on September 15, 2011 and due to September 15, 2012 with annual interest rate 3.90%. So the annual risk-free return rate in China can be assumed as 3.90%, expressing mathematically is: $r_f = 3.9\%$.

To ensure the precision of daily risk premium of the stocks, the daily stock return rate has to be re-calculated, since the stocks are not traded every day in the year but the annual risk-free return rates counts every day, which is 365 days a year. Set the trading day stock return rate as R, the daily stock return rate as R_{ek}, and the number of total trading days in the sample period as n. Since the first trading day does not have return rate in this research, the total valid number of days with daily return rate in the sample is $(n-1)$, and then the equation is:

$$R_{ek} = \frac{R \times \frac{n-1}{3}}{365}$$

The same process to the SSE composite index daily return rate, but replace the stock daily return rate R by the index daily return rate $R_{index\ daily}$, so the equation is:

$$R_M = \frac{R_{index\ daily} \times \frac{n-1}{3}}{365}$$

(n is the number of days the stocks are traded in the sample period)

Overall, mathematically the CAPM regression function can be expressed as follows:

$$R_{ek} - \frac{r_f}{365} = \alpha_k + \beta_k \cdot \left(R_M - \frac{r_f}{365}\right) + \xi_{ik}$$

Where R_{ek} is the daily return rate of the SSE sector index in the industry k

r_f is the annual risk-free return rate

α_k is the constant term

β_k is the sensitivity coefficient between industry k and the whole market

R_M is the daily return rate of the SSE composite index

The regression is performed between daily market risk premiums, $\left(R_M - \frac{r_f}{365}\right)$, and daily sector risk premiums, $(R_{ek} - \frac{r_f}{365})$. The daily market risk premiums are the independent variables and the daily sector risk premiums are dependent variables. And the annual risk-free rate r_f is found with the T-Bond that equals to 3.90%.

After the regression, the estimated parameters are found, and from the CAPM:

$$r_{ek} - r_f = \alpha_k + \beta_k(r_M - r_f) + \varepsilon_{ek}$$

Where r_{ek} is the annual return rate of industry *k*

r_f is the annual risk-free return rate

α_k is the constant term

β_k is the sensitivity coefficient between industry *k* and the whole market

ε_{ek} is the residual.

We got the estimated stock annual return rate in the economy sector:

$$\hat{r}_{ek} = \hat{\alpha}_k + r_f + \hat{\beta}_k(r_M - r_f)$$

Where $\hat{r}_{ek}$ is the estimated annual return rate of industry *k* from CAPM regression

$\hat{\alpha}_k$is the estimated constant term from CAPM regression

r_f is the annual risk-free return rate

$\hat{\beta}_k$ is the estimated value of β_k from CAPM regression

$r_M$is the annual return rate of stock market

Sample data of the indices are collected from the first business day in 2009 to the last business day in 2011 from the Shanghai Stock Exchange. There are 10 economy sectors marked in SSE: 1. Energy Sector; 2. Materials Sector; 3. Industrials Sector; 4. Consumer Discretionary Sector; 5. Consumer Staples Sector; 6. Health Care Sector; 7. Financial Sector; 8. Information Technology Sector; 9. Telecommunication Service Sector; 10. Utilities Sector. And this classification is based on the Chinese National Development and Reform Commission's segment of the market. Even though some of the industries are not open to the foreign direct investment, there will be an optimistic assumption that they will be open soon. So the calculation of the economy sector's cost of equity will be performed as follows:

1. Energy Sector

The regression performed by Microsoft Excel 2007 with data analysis tool add-in. And the data is collected from SSE database via internet.

Table 5.4 **The Regression on CAPM from 2009 to 2011(Energy Sector)**

$$R_{ek} - \frac{r_f}{365} = \alpha_k + \beta_k \cdot \left(R_M - \frac{r_f}{365}\right) + \xi_{ik}$$

Regression Statistics	
Multiple R	0.902705293
R Square	0.814876846
Adjusted R Square	**0.814620798**
Standard Error	0.006246156
Observations	725

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	**0.000223687**	0.000231988	**0.96421456**	**0.335260300**
X Variable 1	**1.298319431**	0.023014248	**56.41372375**	**5.0535E-267**

*Significant at the 0.01 level (2-tailed)

The Table 5.4 presents the regression results for the CAPM on Energy Sector. The regression is set up between daily market excess returns and daily sector excess returns, with independent variable daily market excess return rate and dependent variable daily sector return rate. The estimated sensitivity coefficient, $\hat{\beta}_{Energy}$, is 1.298; the Student T-test on parameter β_{Energy} is conducted within the analysis and the test is 2-tailed at the significance of 0.01; the P-value here is far less than 0.01, which means $\beta_{Energy}$is not likely to be zero. Moreover, the $\beta_{Energy}$is greater than one that indicates the share investors estimate the stocks in energy sector have higher risk than the market average. And they require more return from this riskier investment portforlio.

The constant term is statistically insignificant, which means we cannot reject the null hypothesis that the constant term is zero. So the constant term is believed to be zero in

the regression. If all the stock prices are fairly priced in long-term, the constant term in the CAPM regression is always statistically indistinguishable from zero (Burton Malkiel, 1995:549-72). And the non-zero constant values in the regressions are mostly because of the negative return rates in the sample period, moreover, the constant term showing positive or negative value indicating the better or worse than CAPM has expected, but this superior or inferior performance could not have been forecasted in advance (Bodie et al. 2011). And the CAPM states that the expected value of the constant term is zero for all securities, whereas the index model representation of the CAPM holds that the realized value of the constant term should average out of zero for a sample of historical observed returns (Burton Malkiel, 1995). In addition, just as important, the sample's constant term should be unpredictable. After all, in this case, the zero constant term means the stocks perform the same as the CAPM predicts.

In addition, the Adjusted R Square value, 0.815, is quite satisfactory as well. So the annual return rate from energy sector is:

$$\hat{r}_{eEnergy} = r_f + 1.298 \times (r_M - r_f)$$

With the annual market return rate 7.62% and annual risk-free return rate 3.90%, the final annual stock return rate in energy sector is 8.73%. And this is the cost of equity in Chinese Energy Sector.

2. Materials Sector

With the same method, the regression on material sector is presented as follows:

Table 5.5 **The Regression on CAPM from 2009 to 2011(Materials Sector)**

$$R_{ek} - \frac{r_f}{365} = \alpha_k + \beta_k \cdot \left(R_M - \frac{r_f}{365}\right) + \xi_{ik}$$

Regression Statistics	
Multiple R	0.910885226
R Square	0.829711896
Adjusted R Square	**0.829476366**
Standard Error	0.005776632
Observations	725

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	**0.000169203**	0.000214550	**0.7886406**	**0.430580615**
X Variable 1	**1.263278965**	0.021284263	**59.3527235**	**3.8527E-280**

*Significant at the 0.01 level (2-tailed)

The results from the regression shows the goodness of fit that Adjusted R Square value is 0.829, is good enough to represent the dependent variables. And $\beta_{Materials}$is distinguishable from zero, which is statistically significant. The same process has been taken to the constant term, which cannot reject the null hypothesis with its value equals to zero, $\hat{\alpha}_{Materials} = 0$. Furthermore, the zero constant term can be interpreted as the stocks prices are well predicted by CAPM. The same as the energy sector, materials sector has $\beta_{Materials}$ over one, and this means the sector stocks have higher risk than the market portfolio. Investors are asking for more return from riskier portfolios.

So the cost of equity in Chinese Materials Sector is:

$$\hat{r}_{eMaterials} = r_f + 1.263 \times (r_M - r_f)$$

Put in the annual market return rate and annual risk-free return rate, we got the cost of equity in Chinese Material Sector is 8.60%.

3. Industrials Sector

The industrial sector is the most foreign invested economy sector in China[11]. So it is necessary to show the details of the regression results in here to cope with the aim of the thesis.

Table 5.6 **The Regression on CAPM from 2009 to 2011(Industrials Sector)**

$$R_{ek} - \frac{r_f}{365} = \alpha_k + \beta_k \cdot \left(R_M - \frac{r_f}{365}\right) + \xi_{ik}$$

Regression Statistics	
Multiple R	0.945733226

[11] http://www.mofcom.gov.cn/

R Square	0.894411335
Adjusted R Square	**0.894265292**
Standard Error	0.003664336
Observations	725

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	**-0.000131915**	0.000136097	**-0.96927587**	**0.332731700**
X Variable 1	**1.056594481**	0.013501412	**78.25807223**	**0**

*Significant at the 0.01 level (2-tailed)

In the table, the CAPM regression has a high interpretive power with the Adjusted R Square value being 0.894. And the sensitivity coefficient is has 0 probability to equal to the critical value, zero, in the Student T-test. The constant term is statistically insignificant that means it is believed to equal to zero, thus it indicates the stock prices in the industrial sector are well predicted by CAPM. And the industrials sector stocks have almost the same risk as the market portfolio, but slightly higher.

So the cost of equity in Chinese Industrials Sector can be estimated as:

$$\hat{r}_{eIndustrials} = r_f + 1.057 \times (r_M - r_f)$$

The current cost of equity in Chinese Industrial Sector is 7.83%

With the same method of CAPM regression, we got the cost of equity in other economy sectors with some of the statistic figures shown in following table:

Table 5.7 **Regression on CAPM from 2009 to 2011 (Other Sectors)**

Economy Sector	**Sensitivity Coefficient(β_k)**	**t-Stat**	**P-value**	**Adjusted R Square**	**Estimated Cost of Equity**
Consumer Discretionary	1.047	48.86845	2.61E-231	0.767	7.79%
Consumer Staples	0.884	35.08423	3.08E-158	0.629	7.19%
Health Care	0.765	23.11035	6.53E-89	0.424	6.74%
Financials	1.070	53.85443	3.04E-255	0.800	7.88%

Information Technology	1.089	35.15939	1.16E-158	0.630	7.95%
Telecommunication Service	0.976	32.21432	6.97E-142	0.589	7.53%
Utilities	0.935	50.36391	1.26E-238	0.778	7.38%

*Significant at the 0.01 level (2-tailed).

*The data descriptions are shown in the appendix.

All the constant terms cannot reject the hull hypothesis that they are zero, so all of them are believed equal to zero. And this means the stocks' prices in these sectors perform the same as the CAPM predicts. Only consumer staples sector, health care sector, telecommunication service sector and utilities sector are considered less risky, because all of them have β_k less than one, and the health care sector is believed to have least risk in equity investment. These economy sector's costs of equity are based on the data from 2009 to 2011, and the goodness of fit, Adjusted R Square values, are very satisfactory, which means the CAPM has a good representative power. The omitted details in regressions are listed in the appendix as well.

5.7.2 Cost of Debts in China

Since the loans are the main financing resource in China, the cost of debt is a very important element in computing the total cost of capital in China. According to the analysis on Chinese financial system, there are two main debt financing resources that are bank loans and corporate bonds.

In 2011, the loans to enterprises and other sectors in China is RMB 41,038.67 billion[6] and corporate debts in the bond market is RMB 1,681.2 billion[5], so the ratio is 20.058:1, and this will be the weight in calculating the overall corporate debt interest rate.

The interest rate of the loans should be calculated with the weight of different type of financing debts: short-term loans and billing finance, medium-term debt, and long-

term loans. Estimating the national wide bank loan interest rates, the best benchmark is the set of interest rates published by the central bank, PBOC (See Table 5.8). Because all commercial banks other financing institutions in the country can vary the interest rate in their loans according to the benchmark interest rate from the central bank, but the mean value of all the individual interest rates applied in the country will be the benchmark interest rate. The only technical adjustment is performed based on the length of the loans that should be weighted with financing volumes of them in overall cost of debt in loans.

Table 5.8 **Benchmark Interest Rate of Loans in RMB**

Duration	Interest Rate (%)
6 Month	5.60
1 Year	6.06
1 to 3 Years	6.10
3 to 5 Years	6.45
Over 5 Years	6.60

*Source: PBOC , 2011-02-09

Among all the loans to in 2011, RMB 41,038.67 billion, there are RMB 17,450,444 million short-term loans and billing finance which can use the interest rate of 1 year; and RMB 23,154,758 million are medium and long-term loans which can use the interest rate of the average of 6.45% and 6.60%, that is, 6.525%; so the rest among would apply the interest rate 6.10%[6]. Mathematically it is:

$$r_{dLoans} = \frac{17{,}450{,}444million}{41{,}038.67billion} \cdot 6.06\% + \frac{23{,}154{,}758million}{41{,}038.67billion} \cdot 6.525\% + \frac{443{,}468million}{41{,}038.67billion} \cdot 6.10\%$$

And the result is $r_{dLoans} = 6.32\%$, which means the loans firms take in China have 6.32% annual interest rate.

The other component of debt financing is the corporate bonds. In this research, the bonds information is gathered from SSE Bond Market. The SSE Bond Market database provides all the information of the bonds listed, and the interest rates are all marked with annual interest rate that gives convenience to estimate the cost of equity

in corporate bonds. From January 2006 to April 2012, there are 245 corporate bonds issued, including some bonds paid back already[12]. The weighted average of the annual interest rates is calculated as follows:

$$r_{dBonds} = \sum \frac{Total\ Issued\ Value\ of\ Bond\ i}{Total\ Issued\ Value\ of\ Corporate\ Bonds} \cdot r_{Bond\ i}$$

And in the equation, $r_{Bond\ i}$ is the interest rate of Corporate Bond i. After the manipulation with the empirical data, the final annual interest rate of corporate bonds is 5.94%, which means issuing the corporate bonds to finance the company has the cost of debt of 5.94%, $r_{dBonds} = 5.94\%$.

The cost of debt is a weighted average of both interest rate of loans and the interest rate of corporate bonds, and they are weighted by their percentage of the totally debts financing value as introduced at the beginning of this part. And the equation is:

$$r_d = \frac{Loan\ Financing\ Value}{Total\ Debt\ Financing\ Value} \times r_{dLoans} + \frac{Bond\ Financing\ Value}{Total\ Debt\ Financing\ Value} \times r_{dBonds}$$

After the manipulation with the numbers we obtained: in 2011, the loans to enterprises and other sectors in China is RMB 41,038.67 billion[6] and corporate debts in the bond market is RMB 1,681.2 billion[5], so totally debt financing sums up to RMB 42719.87 billion; in China, the loans' annual interest rate, r_{dLoans} , is 6.32%, and the annual return rate of corporate bonds, r_{dBonds} is 5.94%. Finally computed out the cost of debt in China is 6.31%, $r_d = 6.31\%$.

5.7.3 Summarize

[12] http://www.sse.com.cn/

After both cost of equity and cost of debt have been sort out, the next step is the summing up of them with Weight Average Cost of Capital, in addition, the corporate profit tax will be included in the WACC and the final model is After-Tax Weight Average Cost of Capital, in mathematic equation is:

$$\text{After-tax WACC} = (1 - T_c) \cdot r_d \cdot \frac{D}{V} + r_e \cdot \frac{E}{V}$$

Where T_c is the corporate tax rate

r_d is the annual return rate of debt financing

$\frac{D}{V}$ is debt-to-assets ratio

r_e is the annual return rate of equity financing

$\frac{D}{V}$ is equity-to-assets ratio

The tax rate is published on the website of Chinese State Administration of Taxation, and it is the same as the figure we found in Doing Business Organization. Therefore, in China, the calculated corporate profit tax rate, the corporate income tax 20% plus levies for construction and maintenance of river projects takes 1% of the business profits, is 21%, as argued in Chapter 2.4.

However, the capital structure is a key point in WACC, which influences the weights of different types of financing costs. In this research, we use different approach to obtain this information: for the national perspective, the Financial Stability Report provides an overall average debt-to-assets ratio, and this can be used in calculation; for the economy sectors, the All-China Federation of Industry and Commerce publishes the data of debt-to-assets ratios. These official statistic figures have high validity and very practical in calculating with WACC.

The enterprises' debt-to-assets ratio in China in 2011 is 60.2%, and this ratio remains the same to the previous year with relatively little change for years[13]. As result, the $\frac{D}{V} = 60.2\%$ in national cost of capital calculation. Because of different categorize methods from SSE and All-China Federation of Industry and Commerce, the debt-to-

[13] PBOC Financial Stability Report 2011: 71b

assets ratios have to be manipulated. In the latest report from All-China Federation of Industry and Commerce, there are more economy sectors, so the average value of the sub sectors is taken as the whole sectors debt-to-assets ratio. The figures are listed in the Table 5.9.

Table 5.9 **Debt-to-Asset Ratio 2011 (by Sector)**

Unit: %

Economy Sector	Number of Sub-Sectors	Sub-Sectors Debt-to-Asset Ratios	Debt-to-Asset Ratio in Sector
Energy	1	45.76	**45.76**
Materials	3	66.65; 53.51; 58.86	**59.67**
Industrials	5	44.29; 40.28; 35.11; 41.71; 51.13	**42.54**
Consumer Discretionary	2	38.04; 37.16	**37.60**
Consumer Staples	3	58.36;51.28; 33.04	**47.56**
Health Care	1	36.11	**36.11**
Financials	1	72.93	**72.93**
Information Technology	2	40.09; 26.14	**33.12**
Telecommunication Service	1	26.14	**26.14**
Utilities	1	59.18	**59.18**

*Data Source: Reports of Financial Indicators of Listed Companies in SSE, All-China Federation of Industry and Commerce, 2011

Since all the key elements of the After-Tax WACC model have been found, the calculation can be performed. The national scale cost of capital is calculated as follows:

$$r_e = 7.62\%$$
$$r_d = 6.31\%$$

$$T_C = 21\%$$

$$\frac{D}{V} = 60.2\%$$

$$\frac{E}{V} = 1 - \frac{D}{V} = 39.8\%$$

And

$$\text{After} - \text{Tax WACC} = (1 - T_c) \cdot r_d \cdot \frac{D}{V} + r_e \cdot \frac{E}{V}$$

So the Cost of Capital in China is 6.03%. (Number is rounded to have two digits, precise number is in the appendix.)

By implementing the same approach, we can calculate the cost of capital in all the other economy sectors. So manipulating the corresponding data to each economy sector in the model, we got the cost of capital in the table 5.10.

Table 5.10 **Cost of Capital in China**

Unit: %

Economy Sector	Cost of Equity	Cost of Debt	Cost of Capital
Energy	8.73	6.31	**7.01**
Materials	8.60	6.31	**6.44**
Industrials	7.83	6.31	**6.62**
Consumer Discretionary	7.79	6.31	**6.73**
Consumer Staples	7.19	6.31	**6.14**
Health Care	6.74	6.31	**6.11**
Financials	7.88	6.31	**5.77**
Information Technology	7.95	6.31	**6.97**
Telecommunication Service	7.53	6.31	**6.86**
Utilities	7.38	6.31	**5.96**

Among the 10 economy sectors, the energy sector in China has the highest cost of capital, and the health care sector has the lowest cost of capital. The energy sector has very high cost of equity, which drives up the total cost of capital. Investors in China take the business in energy sector as high risk choice and the expected return rate of the shares is higher. On the contrary, the health care sector has a really low cost of equity, and then the lowest cost of capital.

Overall, the numbers shown in the table are rounded, and the more precise figures are listed in the appendix.

5.8 Cost of Capital in Norway

In study of cost of capital in Norway, the researcher will apply the theories and models on the empirical data from Norway in the same way as the study has been done with Chinese market. However, the study of cost of capital in Norway serves as a comparative reference for the investors from Norway understand Chinese market better. So the cost of capital calculation on empirical data will be conducted correspondingly in three steps, which are calculation of cost of equity with CAPM, cost of debts with weighted average, and the sum up of cost of capital with WACC.

The only difference in the process is that the arguments of all the calculation results are simplified comparing with the study in Chinese market since the Norwegian investors can easily understand Norwegian market instead of Chinese one.

5.8.1 Cost of Equities in Norway

To be comparative, the cost of equity in Norway is calculated in two scales, national scale and economy sector scale, that is, as the same in the study of Chinese stock

market. The national scale cost of equity is used as a benchmark to the other stock investments, which represents market annual return rate, r_M, in economy sector CAPM.

5.8.1.1 Market Return Rate

The market return rate in Norway is computed with the arithmetic mean value of Oslo Børs Benchmark Index (OSEBX) return rate on trading days, and then use the same technique to convert this value to annual return rate. To be comparative, we use the same recent 3 years, 2009 to 2011. And the functions can be explained mathematically as follows:

$$\bar{R}_M = \frac{\sum_{i=1}^{n} r_i}{n-1}$$

$$r_M = \bar{R}_M \times \frac{n}{3}$$

Where $\bar{R}_M$ is the average daily market return rate

r_M is the annual market return rate

r_i is the return rate on day *i* (statistically *i* starts from 0)

n is the number of days the stocks are traded during the sample period

Totally, there are 756 observations with 755 return rates from the sample. As the same process taken in Chinese market, the annual return rate result has one day holding the estimated average daily return rate from the sample period.

Eventually, the OSEBX data from 2009 to 2011 represented an annual return rate of 19.90%, that is, $r_M = 19.90\%$.This figure is much higher than the stock return rate in China. Therefore, the investors in Norway have very high, over 2 times, expectation on investments in shares. So the business that operates in Norway has greater pressure in profitability from its shareholders.

5.8.1.2 Cost of Equity in Economy Sector

The investment in an economy sector is a portfolio, and the expected return rate can be calculated with CAPM. The best share holding diversification is the structure of the economy sector index. With the same category as in SSE, the Oslo Børs Exchange sets up the economy sector indices as well. So the dependent variable is set as the Oslo Børs Exchange sector index of the certain economy sector, which selects out all the stocks of firms in that industry, and the independent variable is the OSEBX, which represent all the stocks in Oslo Børs Exchange. The sensitivity coefficient β_k is also calculated with the daily data, which provide more data. The risk-free return rate in Norway is collected from the online reporting of Norwegian central bank, Norges Bank. And Norges Bank states that the government bond's return rate reflects the market return rate. Among the government bonds, the Treasury Bills are short term risk-free investments, and the interest rate of Treasury Bill matures in 12 months, one year, is used as the market risk-free return rate in this paper. From the Norges Bank website, it published the annual interest rate of 12-month in Treasury Bill in 2011 is 2.12%[14], that is, $r_f = 2.12\%$ in Norway.

The daily stock return rate is re-calculated as in previous calculation for China. The trading day stock return rate is R; the daily stock return rate is R_{ek}; and the number of total trading days in the sample period is n. The first trading day does not have return rate in this research, so $(n-1)$ days' return rate is calculated, and then the equation is:

$$R_{ek} = \frac{R \times \frac{n-1}{3}}{365}$$

The same process to the daily return rate of OSEBX, but replace the stock daily return rate R by the index daily return rate $R_{index\ daily}$, so the equation is:

[14] Norges Bank, Interest rates
http://www.norges-bank.no/en/price-stability/interest-rates/

$$R_M = \frac{R_{index\ daily} \times \frac{n-1}{3}}{365}$$

All the same as the calculation in China, the economy sector's stocks return rates are computed with the CAPM regression function that is mathematically expressed below:

$$R_{ek} - \frac{r_f}{365} = \alpha_k + \beta_k \cdot \left(R_M - \frac{r_f}{365}\right) + \xi_{ik}$$

Where R_{ek} is the daily return rate of the SSE sector index in the industry *k*

r_f is the annual risk-free return rate

α_k is the constant term

β_k is the sensitivity coefficient between industry *k* and the whole market

R_M is the daily return rate of the SSE composite index

The regression is performed between the independent variables -- daily market risk premiums ,$\left(R_M - \frac{r_f}{365}\right)$, and the dependent variables -- daily sector risk premiums, $(R_{ek} - \frac{r_f}{365})$. In the sample period, there are 756 days' trading data from Oslo Børs Exchange that is $n = 756$. And the annual risk-free rate r_f is found with the government bond that equals to 2.12%. By accomplishing the regression, the estimated parameters, α_k, β_k, are found. Since the CAPM is

$$r_{ek} - r_f = \alpha_k + \beta_k(r_M - r_f) + \varepsilon_{ek}$$

Where r_{ek} is the annual return rate of industry *k*

r_f is the annual risk-free return rate

α_k is the constant term

β_k is the sensitivity coefficient between industry *k* and the whole market

ε_{ek} is the residual.

We transform the equation and get the estimated stock annual return rate in the economy sector as:

$$\hat{r}_{ek} = \hat{\alpha}_k + r_f + \hat{\beta}_k(r_M - r_f)$$

Where $\hat{r}_{ek}$ is the estimated annual return rate of industry *k* from CAPM regression

$\hat{\alpha}_k$ is the estimated constant term from CAPM regression

r_f is the annual risk-free return rate

$\hat{\beta}_k$ is the estimated value of β_k from CAPM regression

r_M is the annual return rate of stock market

Sample data of the indices are collected from the first business day in 2009 to the last business day in 2011 from the Oslo Børs Exchange database, 756 days. To be representative of the economy sectors, this research uses economy sector indices market by Oslo Børs Exchange. The indices have been officially used as the economy sector indicator on the Oslo Børs Exchange as well. Therefore the indices respectively are: Energy, OSE10GI; Materials OSE15GI; Industrials OSE20GI; Consumer Discretionary OSE25GI; Consumer Staples OSE30GI; Health Care OSE35GI; Financials OSE40GI; Information Technology OSE45GI; Telecommunication Services OSE50GI; and Utilities OSE55GI. All the economy sector categories are the same as in Chinese Stock Market, thus the results are more comparative. And the results of calculations are shown in the table (See Table 5.11).

Table 5.11 **Regression on CAPM from 2009 to 2011 in Norway (by Sector)**

Economy Sector	Sensitivity Coefficient(β_k)	t-Stat	P-value	Adjusted R Square	Estimated Cost of Equity
Energy	0.948	76.96105	0	0.887	18.97%
Materials	1.180	47.02884	2.75E-226	0.746	23.09%
Industrials	0.785	42.51243	2.69E-202	0.706	16.08%
Consumer Discretionary	0.841	30.92220	3.61E-136	0.559	17.07%
Consumer Staples	0.619	22.05259	1.57E-83	0.392	13.12%
Health Care	0.470	12.96542	7.61E-35	0.181	10.48%

Financials	1.049	32.62909	3.06E-146	0.585	20.77%
Information Technology	0.652	23.10172	1.12E-89	0.414	13.71%
Telecommunication Service	0.801	26.89936	3.21E-112	0.489	16.36%
Utilities	0.244	9.959039	4.94E-22	0.115	6.46%

*Significant at the 0.01 level (2-tailed).

*The data descriptions are shown in the appendix.

All the constant terms of the regressions cannot reject the hull hypothesis that they are zero, so we believe that they equal zero in the CAPM. So we believe the CAPM predicts well of the stocks' prices behavior in the market and there was no superior or inferior performance occurred.

Moreover, all the β_k in the regression tests are statistically significant that means they are not equal to zero. But only materials sector and financial sector have their β_k over 1, all the others have less than 1 in β_k.This means the materials sector and financial sector are more sensitive to market growth, i.e. the materials sector and financial sector are believed more risky than the market risk, and the investors require a higher return from investing in these two economy sectors. On the contrary, all the other eight economy sectors have β_k less than 1, and the utilities sector even has the lowest value of 0.244. These less-than-one sensitivity coefficients represent the lower risk in investing in these economy sectors as well as lower capital return to the investors as well.

However, the goodness of fit is not as high as the regressions performed with Chinese stock market. This is mostly because of the size of the stock market in Norway; the smaller size of the economy sector has more variance caused by individual stock's behavior. Larger quantity of stocks in the economy sector will cancel out the fluctuations of individual stock. Nevertheless, the Adjusted R Square values are totally acceptable according to the aim of this study, even though the utilities sector and health care sector performed poorly in regression. The fitting plot graph of the regressions in utilities sector and health care sector can show that the trend of the variation is interpreted (See Figure 5 and Figure 6).

Figure 5: Utilities Sector X Variable 1 Line Fit Plot

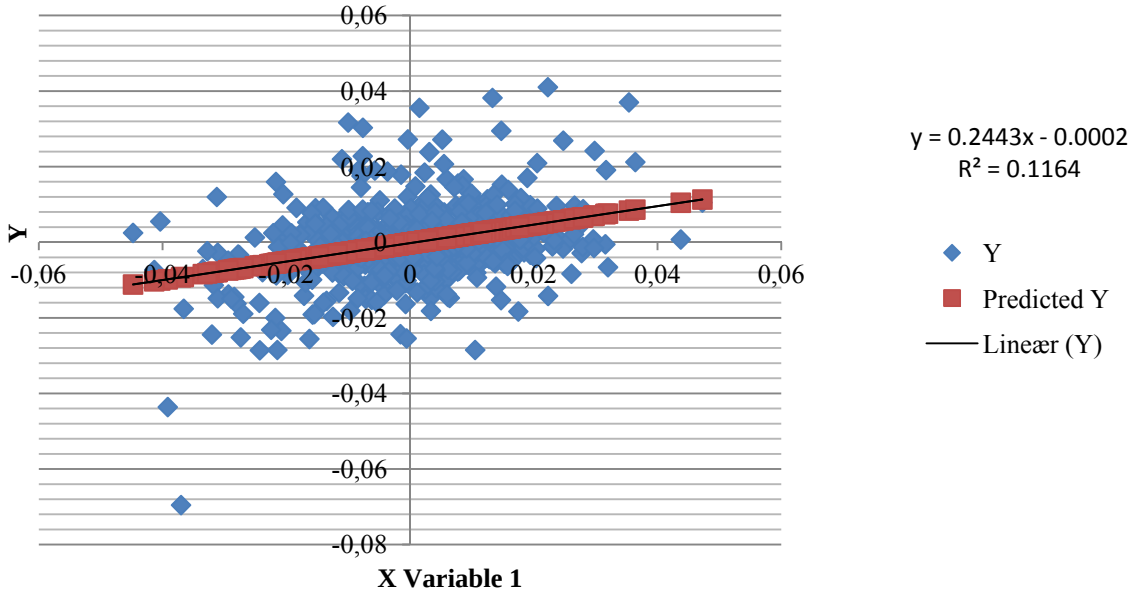
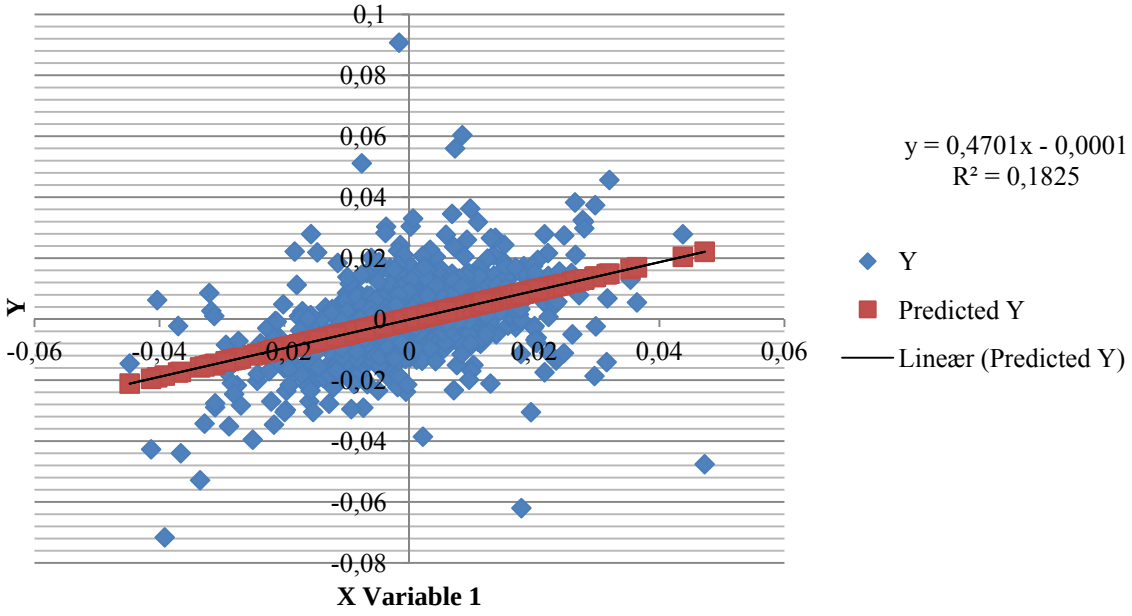


Figure 6: Health Care Sector: X Variable 1 Line Fit Plot



In the graphs, the Y stands for the sector risk premium, and Predicted Y is the figures calculated from the regression; X Variable 1 is the market risk premium, which is set as the independent variable in the regression. The Linear (Y) line is the best fitting line of the Variable Y, and it is overlapped by the Predicted Y Plots. Although the

Adjusted R Square values are low in these two sectors, the trends of data are well interpreted by the regression that makes sense on the final estimation risk premiums of these economy sectors. Also omitted details in regressions are listed in the appendix.

5.8.2 Cost of Debts in Norway

Actually, the loans are the main financing resource in Norway as well, which takes 76% of the corporations' financing; the cost of debt takes a key position in computing the total cost of capital in Norway. As argued in the part of financing resources of Norway, there are two main debt financing resources, and respectively are the bank loans, 55% of the total corporate financing volume, and the corporate bonds, 21% of the total volume of corporate financing[4].

Along with the ratio between bank loans and corporate bonds, the cost of debt is averaged with the weight of the financing volume. The so-called bank loans come from two types of financial institutions in Norway, the commercial banks and the mortgage companies. According to the statistics published in Norges Bank Financial Stability Report, May 2012, at the end of 2011, the total volume of lending from banks, including the foreign banks, sum up to NOK 2,011 billion, and the total volume of lending from mortgage companies is NOK 1,210 billion. So the interest rate of bank loans will be averaged with the weights of banks lending and mortgage lending.

The Statistics Norway published the annual interest rates of bank loans to private enterprise is 5.09% at the end of 2011; and the annual interest rates of lending from mortgage companies to private enterprise is 4.41%[15]. So the calculation of bank loans interest rate is expressed mathematically as below:

$$r_{dLoans} = \frac{2{,}011 billion}{3{,}221 billion} \cdot 5.09\% + \frac{1{,}210 billion}{3{,}221 billion} \cdot 4.41\%$$

[15] Statistic Norway, Interest rate statistics for banks and other financial corporations, 4th quarter 2011. http://www.ssb.no/orbofrent_en/

And the result is $r_{dLoans} = 4.83\%$, which means the all the loans firms taken in Norway have 4.83% annual interest rate in average.

The rest part of debt financing comes from corporate bonds. The data comes from listed bonds in the Oslo Børs Exchange. The interest rates of all the industrial and commercial bonds are weighted by the financing amounts. So the function is:

$$r_{dBonds} = \sum \frac{Total\ Issued\ Value\ of\ Bond\ i}{Total\ Issued\ Value\ of\ Corporate\ Bonds} \cdot r_{Bond\ i}$$

Where $r_{Bond\ i}$ is the interest rate of Corporate Bond i.

By manipulation with the empirical data, the final annual interest rate of corporate bonds is 6.67%, which means in Norway issuing the corporate bonds to finance the company has the cost of debt of 6.67%, $r_{dBonds} = 6.67\%$.

The overall cost of debt in the country is a weighted average of both interest rate of loans and the interest rate of corporate bonds. The percentages of each debt financing method's financing value in total debt financing volume are used as the weight in calculation. This is the same with the calculation in Chinese cost of debt.

$$r_d = \frac{Loan\ Financing\ Value}{Total\ Debt\ Financing\ Value} \times r_{dLoans} + \frac{Bond\ Financing\ Value}{Total\ Debt\ Financing\ Value} \times r_{dBonds}$$

Along with data obtained from Norges Bank's Financial Stability Report, 2012, of financing volumes, which are NOK 27,565 million enterprises raised up in bonds market in 2011 and NOK 73,200 million from the banks and mortgage companies[4], we sets in the return rate of loans and return rate of corporate bonds, $r_{dLoans} = 4.83\%$ and $r_{dBonds} = 6.67\%$. Eventually, the overall annual return rate of debts, i.e. the cost of debt in Norway is 5.34%, that is, $r_d = 5.34\%$.

5.7.3 Summarize

Following the calculation of cost of equity and cost of debt, the Weight Average Cost of Capital is used to sum up the cost of capital, in addition, the corporate profit tax will be included in the WACC and the final model is After-Tax Weight Average Cost of Capital. So the function is:

$$\text{After-tax WACC} = (1 - T_c) \cdot r_d \cdot \frac{D}{V} + r_e \cdot \frac{E}{V}$$

Where T_c is the corporate tax rate

r_d is the annual return rate of debt financing

$\frac{D}{V}$ is debt-to-assets ratio

r_e is the annual return rate of equity financing

$\frac{D}{V}$ is equity-to-assets ratio

The tax rate in Norway is collected from Doing Business Organization which is founded The World Bank and International Finance Corporation. As stated in Chapter 2, the business profit tax in Norway is 28%, so $T_c = 28\%$.

The other component in the After-Tax WACC is the capital structure, which influences the weights of different types of financing costs. With the same method as we took in China, we use different approach to obtain this information: for the national perspective, the Norges Bank's Financial Stability Report provides the national scale equity-to-asset ratio, $\frac{E}{V}$, and the other non-financial economy sectors, Statistic Norway publishes the data of equity-to-assets ratios. The financial sector's equity-to-asset ratio is calculated with weighted average of all the financial companies listed in Oslo Børs Exchange. The weight is set as the market capital of the company and the equity-to-asset ratios are collected from the annual reports of 2011 from all the companies listed in the group of financial index. We can trust these statistic

figures from these official publications have high validity and can be used in calculating with WACC.

The average enterprises' equity-to-assets ratio in Norway is 38.0%[4], so the $\frac{E}{V} = 38.0\%$ in national cost of capital calculation. The calculation of the equity-to-asset ratio in financial sector is attached in the appendix and final equity-to-asset ratio of the financial sector is 18.07%. And the average equity-to-asset ratio of all the sectors generated from Statistic Norway is listed in table 5.12. The list of sub-sectors grouping is attached in the appendix.

Table 5.12 **Equity-to-Asset Ratio (by Sector)**

Unit: %

Economy Sector	Number of Sub-Sectors	Equity-to-Asset Ratio in Sector
Energy	5	**41.16**
Materials	10	**42.61**
Industrials	11	**33.85**
Consumer Discretionary	22	**31.58**
Consumer Staples	5	**36.94**
Health Care	2	**35.65**
Financials	-	**18.07**
Information Technology	1	**43.40**
Telecommunication Service	2	**42.20**
Utilities	8	**37.41**

*Data Source: Statistic Norway 2011

The information technology sector has the highest equity-to-asset ratio, and it is because the bank-based financial system in Norway has strict risk aversion on the new industries such as IT and the share market takes the advantage of investing in risky business to seek for better return (Bodie et al. 2011).

When every variable is settled in After-Tax WACC model, the calculation can be performed. The national scale cost of capital is calculated as follows:

$$r_e = 19.90\%$$
$$r_d = 5.34\%$$

$$T_C = 28\%$$

$$\frac{E}{V} = 38.0\%$$
$$\frac{D}{V} = 1 - \frac{E}{V} = 62.0\%$$

And

$$\text{After} - \text{Tax WACC} = (1 - T_c) \cdot r_d \cdot \frac{D}{V} + r_e \cdot \frac{E}{V}$$

So the national scale Cost of Capital in Norway is 9.94%. (Number is rounded to have two digits; precise number is in the appendix.) And with the same approach, we got the cost of capital in all the other economy sectors listed in the table 5.13.

Table 5.13 **Cost of Capital in Norway**

Unit: %

Economy Sector	Cost of Equity	Cost of Debt	Cost of Capital
Energy	18.97	5.34	**10.07**
Materials	23.09	5.34	**12.04**
Industrials	16.08	5.34	**7.98**
Consumer Discretionary	17.07	5.34	**8.02**
Consumer Staples	13.12	5.34	**7.27**
Health Care	10.48	5.34	**6.21**
Financials	20.77	5.34	**6.90**

Information Technology	13.71	5.34	**8.12**
Telecommunication Service	16.36	5.34	**9.13**
Utilities	6.46	5.34	**4.82**

In the 10 economy sectors, there are two of them having higher cost of capital than the national scale average, which is energy sector and materials sector. From their structure of capital, we found they have relatively high equity-to-asset ratio among all the economy sectors; at the same time, materials sector has higher riskiness comparing with other economy sector, $\beta_{Materials} = 1.18$, and the energy sector has higher equity-to-asset ratio than financial sector. The utilities sector has the lowest cost of capital because it has least market risk, $\beta_{Utilities} = 0.24$, and a low equity-to-asset ratio. Overall, the numbers shown in the table are rounded, and the more precise figures are listed in the appendix.

5.9 Financing Expenses

Besides the cost of capital, the other part of cost to the financing of firm's operation is the financing expenses. And as we argued in the Chapter 3.2.2, the firms have to pay for the service and registrations for issuing bonds and offering the stocks.

However, the financing expenses are heavily affected by the results between the security issuer and the security agencies, such as the investment banks, security companies, law firms, and public accounting and auditing companies. Overall, in the long-term, the financial expenses will be insignificant to the total financing cost. So the argument of financing expenses is a part to show the sound picture of financing costs, but not comparative between two countries since the variation of the financing expenses is unpredictable across different period of time and individual companies.

5.9.1 IPO costs

According to Jay R. Ritter 1998, the legal, auditing, and underwriting fees are the direct costs associated with Initial Public Offerings (IPOs). And the IPO direct costs consist of: 1. Stock Exchange listing fee; 2 Stock Exchange Annual fee; 3. IPO underwriting and sponsor fees; 4. Auditing expenses; 5. Legal documentation expenses. Nevertheless, the regulations of listed companies state that the listed companies are required to be audited annually. So the auditing expenses and legal documentation expenses will be the one that lasts with the daily operation of the business as general cost, and the calculation of financing expenses of public offering stocks will not include those two types of expenses.

In China, the firms need to go through the verification process of China Securities Regulatory Commission and then public offering the stocks in the stock exchange. So the preparation of the IPO causes the underwriting fees, auditing expenses and legal documentation expenses; after that, there is the stock exchange fee and stock exchange annual fee. Furthermore, there is stamp duty in China, which paid by the issuer of the stocks at 0.1% of the transaction value.

In fact, the IPO in China is commonly accomplished by the security agencies, investment banks: the firms hire the security agency and the security agency normally takes the position of the sponsor and then organizes the IPO team with law firm, public accounting and auditing firm, and advisory firms. This type of service package is considered most efficient and economical, since the firm does not need to coordinate the agencies during the entire IPO preparation process. (Ping An Insurance (Group) Company)

From the latest data released from Sina (Finance Channel), one of the biggest internet news website in China, the total underwriting fees, including sponsor fees, of IPOs in 2011 is RMB 15,234,324,000, and the total amount raised up from the IPOs is RMB 272 billion. So the underwriting fee and sponsor fees are taking up to 5.6% of the financing value. The average cost rate does not mean that much in underwriting fees

as it is a result from the negotiation between the investment bank and the company. Among all the 2011 IPOs, the stock Longsheng (002625) public offered from Zhejiang Longsheng Auto Parts Co., Ltd. raised up RMB 216 million but paid underwriting fee and sponsor fee totally RMB 37.57million that costs 17.38%; on the contrary, Sinovel Wind Group Co., Ltd. just spent RMB 64.19 million on underwriting and sponsor fees to obtain RMB 4,730 million, which only costs 1.38%.

And the Shanghai Stock Exchange charges listing fee: of 0.03% of the stock value, and annual fee: 0.012% of the stock value. So the total financing expenses on stocks financing is 5.742% of the financing value in 2011. But these financing expenses vary much across the companies as well as the time since the fees are settled together with the investment banks and the firms. For example, the average direct cost of IPOs from 1994 to 2008 is only 1.3% of the total stock financing value, and for the private enterprises the cost is 2.28%, but only 1.22% for the national owned enterprises (Xinhong Liu, 2010).

In Norway, the weighted average underwriting gross spread of IPOs is 4.12% (Sami Torstila, 2001), which means the underwriting fee takes 4.12% of the financing value. But there is no security transaction tax as we argued before. And the stock exchanges in Norway charges annual fee of NOK 60 per NOK 1 million capitalization, minimum NOK 130,000 and maximum NOK 1,000,000; and the introduction fee, or listing fee varies according to the market capitalization at the time of listing, but within the range from NOK 300,000 to 900,000 in Oslo Børs and NOK 250,000 to 850,000 in Oslo Axess[16].

5.9.2 Bonds issuing costs

The issuing process of corporate bonds faces the regulation from the China Securities Regulatory Commission as well. Most of the bonds in the Chinese market are issued

[16] http://www.oslobors.no/ob_eng/Oslo-Boers/Listing/Shares-equity-certificates-and-rights-to-shares/Fees

by the listed companies in SSE. And there is a very strict requirement for the companies to issue their bonds. According to the SSE Regulation of Public Issuing Corporate Bond, the company is required: 1. Certified by China Security Regulatory Commission; 2. Total value of bonds should not less than RMB 50 million; 3. The company has good credit rating from veteran credit rating agency. So the procedure is not much easier than IPOs, and this is the reason that most of the bonds are issued by the listed companies on the stock market.

The underwriting and sponsor fees of corporate bonds are much lower than IPOs, together with auditing and legal documentation expenses will be less than 2% of total financing value of the bonds, and annually it takes around 0.2% (Ping An Insurance (Group) Company, 2012). Moreover, the stamp duty doesn't apply on corporate bonds for now. The cost of underwriting fee of the bonds in Norway is 0.37% from the bonds' market value (Arie Melnik & Doron Nissim, 2003).

In SSE, the corporate bond listing fee is 0.01% of the total bonds value, and annual fee of corporate bonds is 0.0096% of the total bonds value[12]. But both of these fees are not charged in China now. And in Norway, Oslo Børs and Oslo ABM have the same fee schedule on bonds. For the listing fee, first loan issued charges NOK 53 per million knoner of outstanding amount with minimum NOK 5,606 and maximum NOK 42,000; for the second and subsequent loans issued, the listing fee is NOK 38.78 per million kroner of outstanding amount and ranges from NOK 4,204 to NOK 31.500; totally, the maximum fee per issuer per year is NOK 400,000. As well as inspection fee is charged in Norwegian bond market, and the fee is: NOK 40,000 per description of the issuer not encompassed by the Prospectus Directive, which is charged to each issuer; and each International Security Identification Number pays NOK 11,000 for the loan description, invitation to tender and loan document for loans with particular standardized terms that are not encompassed by the Prospectus Directive and NOK 13,000 for the loan description, invitation to tender and loan document that are not encompassed by the Prospectus Directive[17].

[17] http://www.oslobors.no/ob_eng/Oslo-Boers/Listing/Oslo-Boers-fees

5.10 Summary of the Empirical Part

The empirical part presented the data collected from the financial markets in both countries. And the data are processed by implementing the methods argued in the theoretical and methodologies chapter. Along with the empirical data, the researcher defined that the financial systems in China and Norway are bank-based financial system that the bank controls most of the financial assets in the economy. And the estimation of cost of capital in both countries is the main topic in empirical part. Different CAPMs are defined with regression on the historical data from the stock market, and the calculation of cost of capital extends to different economy sector level which provides better comparative understanding to investing opportunities and costs. The argument of financing expenses at the end is a brief introduction to this part of financing cost that is not comparative since it varies a lot across different companies as well as different period of time. Moreover, the financing expenses are believed will die out during the business long-run (Yingmei Guo, 2011).

6. Comparison and Analysis

6.1 Introduction of Comparison and Analysis

The comparison and analysis chapter is mainly focusing on the differences of cost of capital in Norway and China. The comparison is performed between stock markets, bond market, and loans; compare both absolute cost of capital values and market risk premiums. The stock market comparison is divided into national level and economy sector level. While, the cost of debt is compared as a whole set and compared by the components that are loans and bonds.

Furthermore, researcher will first give out the interpretation on differences found in the comparison part and then list out each type of financing resource and its cost in two countries. The analyses are mainly around the key parameters, such as the β in CAPMs, and the market risk premiums.

Following the interpretation of the differences, in the analysis part, there is introduction of current situation in China that is not shown from the economical models. Combining with the current national situation, on both macro and micro aspect, the paper gives suggestions to the Norwegian companies on financing strategies in investing in China.

6.2 Comparison of Financing Costs

From the calculation results in empirical part, we can obviously notice that the financing costs are different in China and Norway. Despite the financing expenses, which are not very comparative and will not be long-term effective (Yingmei Guo, 2011), for the national level, Norway has a higher financing cost, where China has cost of capital of 6.03% and Norway has it at 9.94%. The difference is 3.31%, which means on average, the companies in Norway need to spend 3.31% more per year

when they are getting financed from the financial system that includes the stock market, bond market and the loans from financial institutions.

This cost difference comes from the differences in cost of equity and cost of debt in these two countries.

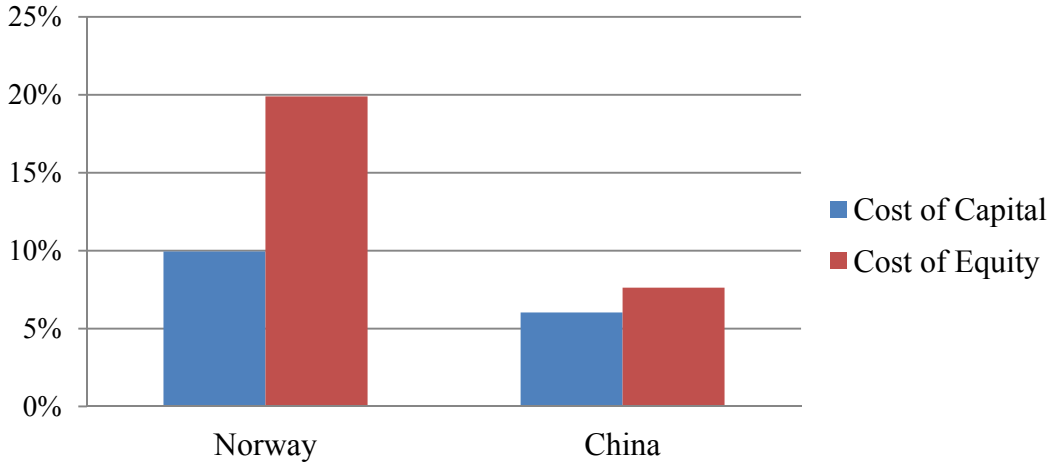
6.2.1 Comparison in Cost of Equity

The cost of equity is calculated from national level and economy level in the empirical part, and the national level cost of equity is believed as the market return rate as well. So the estimation of cost of equity with CAPM in economy sector is based on the market return rate found at national level.

6.2.1.1 National Level

The cost of equity in Norway is as high as 19.90%, however, the cost of equity in China is only 7.62%. The difference in the share market required return, cost of equity, is significant. The cost of equity in China is only 38.29% of the cost of equity in Norway, whereas the total cost of capital in China is 60.66% of the total cost of capital in Norway (see Figure 7). So it means the cost of equity is driving up the cost of capital in Norway compared with the Chinese market.

Figure 7. Cost of Capital and Cost of Equity



The low cost of equity in China is mainly resulting from the heat of IPOs in the market. The Chinese stock market has become the world's largest IPO market in the world in 2009 (China Security Journal, 2009), and this means there is a dilute of capital in the share market. When the amount of investors is relatively stable, but the number of stocks increases sharply, the price of the stocks suffers. And the Chinese economy is highly dependent on exports, as the Chinese central government states all the time, so the series of financial crises in the western world brought unclear market prediction in Chinese economy, specially the equity investment, even though the government has launched several stimulating packages (Wei Zhong, 2012). On the other hand, the Norwegian economy grew stably after the later-2000s financial crisis, and the government has huge surplus instead of being deep in debt (The World Bank, 2012). The better business circumstance can be a reason for the share investors having a higher return require. Moreover, the new issue of stocks in two of Norwegian exchange, Oslo Børs and Oslo Axess, is only 7 IPOs in 2011[18]; comparing with 277 IPOs in Chinese stock market in 2011[10], it is really a stable growth of share amount in total stock market.

In addition, there is another difference in the national scale, that is, the risk-free return rate in these two countries; the risk-free return rate in China is found from one year government bond, T-Bond, with the interest rate of 3.9%, but the risk-free rate in Norway , which is also found from the government bond, is only 2.12%. This is another aspect of the government's financial situation. The government bonds are the financing to governmental services and construction of social facilities, so if the government has surplus in its budget, as a rational decision maker, the willingness to pay interests on its bonds is lower. As result, the risk premium in Norway is very large compare with China.

The market risk premium in Norway is 17.78% but the market risk premium in China is only 3.72%. Norwegian market has 4.78 times of the market risk premium of Chinese market. This can be conclude as in Norway, there is higher market return rate and lower risk free rate; in China, there is lower market return rate and higher risk free rate. In other words, the investors in the share market require more return in Norway

[18] http://www.oslobors.no/ob_eng/Oslo-Boers/Statistics/Issues-statistics

than in China. Furthermore, the market risk premium affects on the CAPM estimation of stock portfolios such as the economy sector stock return rates.

6.2.1.2 Economy Sector Level

The different market risk premiums in Norway and China give a benchmark difference in calculating the cost of equity of economy sectors. The CAPM shows the sensitivity between the market risk premium and portfolio risk premium that means the value of market risk premium is leveraged to the portfolio's risk premium, further to the portfolio's return rate. So the effect of sensitivity coefficient β_k in the CAPM has around 4.78 times of influencing power on cost of equity in Norway that it does in China.

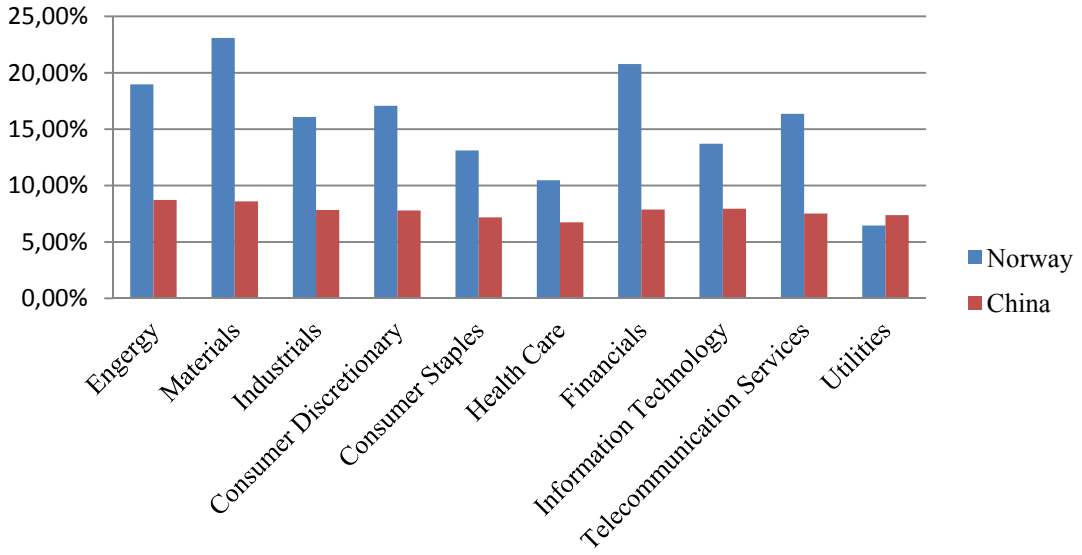
From the regression of the empirical data, we got the results as shown in Table 6.1.

Table 6.1 **Cost of Equity in Norway and China (by Sector)**

Economy Sector	**Sensitivity Coefficient (β_k) in Norway**	**Estimated Cost of Equity in Norway**	**Sensitivity Coefficient (β_k) in China**	**Estimated Cost of Equity in China**
Energy	0.948	18.97%	1.298	8.73%
Materials	1.180	23.09%	1.263	8.60%
Industrials	0.785	16.08%	1.057	7.83%
Consumer Discretionary	0.841	17.07%	1.047	7.79%
Consumer Staples	0.619	13.12%	0.884	7.19%
Health Care	0.470	10.48%	0.765	6.74%
Financials	1.049	20.77%	1.070	7.88%
Information Technology	0.652	13.71%	1.089	7.95%
Telecommunication Service	0.801	16.36%	0.976	7.53%
Utilities	0.244	6.46%	0.935	7.38%

As the results listed here, only utilities sector in Norway has a lower cost of equity than it does in China; all the other economy sectors in Norway have higher cost of equity than in China. And the biggest difference between Norway and China in cost of equity shows up in materials sector, which is 14.49% difference. (See Figure 8)

Figure 8. Cost of Equity in Norway and China (by Sector)



Besides the impact from market premium difference between two countries, the different patterns of β_k in the CAPM in both countries are another reason for the difference.

In Norway, only the β_k in materials sector and financial sectors are greater than 1, which respectively is 1.180 and 1.049. So the investors in Norwegian share market consider these two economy sectors have higher risk than market risk. But in China, more than half of the economy sectors, 6 out of 10, are holding β_k over 1. The energy sector in China has the highest β_k, which is 1.298, and that indicates the investors in the Chinese share market take the energy sector as a high risk investment sector than any other economy sector. Following the energy sector, the materials sector has $\beta_k = 1.263$, which can be interpreted that the materials sector in China is 1.263 times riskier than the market average riskiness. And the other economy sectors that have β_k value more than one are the industrials sector, 1.057, consumer discretionary sector, 1.047, financial sector, 1.070, and information technology sector 1.098.

The economy sectors with β_k less than 1 in Norway are the energy sector, 0.948, industrial sector, 0.785, consumer discretionary sector, 0.841, consumer staples sector, 0.619, health care sector, 0.470, information technology sector, 0.652, telecommunication sector, 0.801, and utilities sector, 0.244. The β_k of health care sector and utilities sectors are very low that means the firms in these economy sectors has very low expected return in its shares from the share investors. The situation in China is not the same, all the β_k that are smaller than one are all around one, not far lower than 25%. The health care sector has lowest β_k, which is 0.765. And this value is higher than the lowest 4 β_k in Norway. The utilities sector in China has the β_k value of 0.935 but in Norway, it is 0.244. And the β_k of consumer staples sector and telecommunication service sector are respectively 0.884 and 0.976.

The β_k patterns give some indication of investors' expected return from holding firms share. The energy sector has higher risk estimated by Chinese stock investors but the Norwegian stock investors believe it is lower risk than the market average. So are the industrials sector, consumer discretionary sector, and information technology sector. In the materials sector and financial sector, firms in both countries face higher required stock return than the average market return, but financing from Chinese stock market to these two sectors is even harder since the sensitivity coefficients of Chinese stocks in material sector and financial sector are greater than they are in Norwegian stock market. All the β_k of the rest economy sectors are pertaining to the same direction in both countries, that is, the cost of equity in these economy sectors is less than the market average cost of equity in the country, but all these economy sectors in Norwegian stock market are considered less risky than they are in Chinese stock market. From the comparison, we found out the stock investors in China have higher riskiness estimation of all the economy sectors than the investors do in Norway.

6.2.2 Comparison in Cost of Debt

The debt is the main financing resource in both countries. And the cost of debt is an influential element in overall cost of capital. The comparison of cost of debt between

Norway and China is done in two steps, the first is the total cost of debt in both countries, and then the comparison goes through the components of the cost of debt, which are the cost of bonds and cost of loans.

The national level cost of debt in Norway is 5.43%, and the national level cost of debt in China is 6.31%. Obviously the debts in China cost more to the firms. And this is because the loans in China have higher interest rate, 1.49% higher, and the debt financing in China concentrates on the bank loans, 96.06% of the debt financing in China. However, as it is shown from the empirical data, the cheapest debt financing in China, the financing from corporate bonds with annual interest rate of 5.94%, has higher interest rate than the Norwegian average cost of debt, 5.43%.

6.2.2.1 Cost of Loans

The loans in both countries dominate the companies' debt financing resources. From the empirical data in this paper, the loan financing takes 72.64% of the financing value of the firms in Norway, and it takes even higher, 96.06% of the financing value of the companies in China.

The annual interest rate of loans in Norway is 4.83%, and the loans come from both banks and mortgage companies as it is stated in Norges Bank's Financial Stability Report 2012. However, in China, the loans granted to the companies are from the banks only[19], and empirical data shows that the five big national banks hold up to 41% of all financial assets in China. The single type of financial institution, the national banks, for obtaining loans will result in higher interest rates, because the policy impact is strong in China. The PBOC, central bank of China, requires the commercial banks in China to implement the macroeconomic guidelines from the central government and provide more support to the weak industries, poor-performing national companies, rural firms, and strategic industries[20]. However, these policy loans always have low return to the bank, so that the banks increase the interest rates

[19] PBOC, http://www.pbc.gov.cn
[20] PBOC, Financial Stability Report 2011:27, various.

of the loans taken by other companies for paying back these poor-performance loams. And this is the point that Carl Walter and Fraser Howie, 2011, argued about: they pointed out the Chinese banks have very poor risk management, and the political impact is way too strong on the banks' lending decisions, so finally there is high interest rate in the market.

6.2.2.2 Cost of Corporate Bonds

The return rate of corporate bonds in China is slightly lower, 0.73%, than it is in Norway. However, the financing from bond market takes 27.36% of the total financing value of the firms in Norway, but only 3.94% for the companies in China. The real situation is the high requirement of the bond market and poor investor protection make the Chinese corporate bonds out of favor.

From the list of Chinese corporate bonds' issuers, we find out only big and famous companies in China can issue their bonds to finance their projects. The requirements of listing the corporate bonds in SSE are stated in the empirical part, which are the certification from China Security Regulatory Commission, and total value of bonds should not less than RMB 50 million, moreover, the company has good credit rating from veteran credit rating agency. Moreover, the China Security Regulatory Commission will not allow the bond financing value taking over 40% of the total assets the firm has. These four requirements screen off a lot of small and medium size companies. Since the interest rate of loans is not much higher than the interest rate of corporate bonds in China, the companies normally choose a more flexible debt financing resource, the bank loans.

6.2.3 Financing Expenses

In this paper, the researcher found out the financing expenses varies much across individual companies. The IPO costs and bond issuing costs are mainly based on the negotiations between the firm and the security agencies, law firm and so on. The stock exchange fees are relatively little. Moreover, these financing expenses will die out during the long-run (Yingmei Guo, 2011), so we take it as equal to the firms in Norway and China, and then the comparison and analysis are mainly about cost of capital in Norway and China.

6.3 Analysis

After the comparison of financing costs in multi-dimensions, the analyses will go through the resources of these costs, which are the financing resources, and list out each type of financing resource and its cost. And then try to give out optimal combination of financing resources that costs the least across Norway and China.

The financing resources are argued throughout the entire research, and they are share market, corporate bonds, and loans from financial institutions. And the costs corresponding to these three resources are found from the empirical data with different approaches, such as CAPM and weighted average. But there are some macroeconomic factors we will argue in the analysis part as well.

6.3.1 Inflation Factor

All the calculation in the empirical chapter are performed with nominal interest rates only, there is no argument about the inflation. But the inflation affects the real return rates from the investments and different countries normally have different inflation

rates. So it is very important to put inflation into the consideration especially when the companies are making decision across countries.

The inflation is calculated in different indices, and in this study, the cost of capital is considered as the required return rate from investors from different markets. And the investors are mostly consumers in the goods market, so the utility of their capital will be measured by how much purchasing power it has as consumers in the goods market. As consequences, the Consumer Price Index (CPI) is taken as the indicator in the study. And CPI is widely used as the inflation indicator in the world as well (N. Gregory Mankiw, 2009).

According to the data publish from Norges Bank, the annual inflation rate, CPI, in 2011 is 1.31%, and there is an inflation target for the monetary policy in Norway that is keeping a low and stable inflation, with annual consumer price inflation of approximately 2.5% over time[21].

The National Bureau of Statistics of China released the lasted annual inflation rate, CPI, in China is 3.30%[22]. However, the western mass media are questioning the validity of this number. In this paper, the official statistic numbers are taken as the valid data with highest priority, even though there are some differences aroused by other publications or news reports.

The inflation rates in Norway is smaller than the CPI in China, so this means the real cost of capital in Norway is even higher than the cost of capital in Chinese market.

[21] http://www.norges-bank.no/en/price-stability/inflation/
[22] http://www.stats.gov.cn/tjsj/ndsj/2011/indexch.htm

6.3.2 The Financing Resources and Cost

The inflation rate in these two countries will be used to deduct the cost of capital that we calculated out from the empirical data. After the inflation deduction, we list out the summarized financing resources and their cost in one illustrative table and find the optimal combination.

Table 6.2 **Financing Resources and Costs**

Financing Resource	Norway	China
Share Market	18.59%	4.32%
Energy	17.66%	5.43%
Materials	21.78%	5.30%
Industrials	14.77%	4.53%
Consumer Discretionary	15.76%	4.49%
Consumer Staples	11.81%	3.89%
Health Care	9.17%	3.44%
Financials	19.46%	4.58%
Information Technology	12.40%	4.65%
Telecommunication Service	15.05%	4.23%
Utilities	5.15%	4.08%
Bond Market	5.36%	2.64%
Loans from Financial Institutions	3.52%	3.02%

The list shows the cost of financing resources in both countries, and the all the costs in China are lower than in Norway. The cost of equity in China is very low, that somehow indicates the average profitability of business in China is not very high either. And after the inflation deduction, the Chinese corporate bonds require only half of the interest rate as the corporate bonds in Norway. The financing resource of loans in two countries has almost the same interest cost. Loans in Norway just take 0.5% more than in China annually.

As it is shown in the table, the firms from Norway should proactively obtain financings from China instead of raising funds in Norway and take it to China. The

best financing resource is issuing corporate bonds; however, the high requirements may make this resource unavailable for the moment. The bank loans in China costs less than the financing from the share market as well. So the ranking of the financing resources are issuing corporate bonds in China, taking bank loans in China, and then offering shares in China, after these, the choice can be taking loans in Norway, issuing corporate bonds in Norway, but the most expensive financing resource is offering shares in Norway.

So for the investors from Norway, the optimal choice for investing in China is establishing joint-ventures and taking technology as the form of contribution. This is the most welcomed method of investing in China as we argued in the introduction chapter.

7. Conclusion

7.1 Summary of the findings

The purpose of this thesis is to explore the financing resources and costs in China and give the Norwegian investors, who are interested in running business in China, a reference to understand the financing issues in China. With comparing to the same analysis on Norwegian market, the researcher tried to provide a trouble-free and comprehensive introduction of financing resources and cost in China.

The paper reveals the economic type in China at beginning. This is the fundamental environment that all the firms are running in. The new economy system is a market oriented mixed economy. And Norway has the same type of economy which makes the further comparison on the same platform. The financial system is the next part that brings the research closer to the topic. Financial system affects the main resource of the corporation finance. Both of China and Norway have bank-based financial system that means the banks in the financial systems in both countries are the main holder of all the financial assets, and the main financing resource to the firms in this type of financial system is the bank loans, and this is proven by the empirical data as well. As well as the main financing resource is defined, all the financing options are given from the financial system, which are the loans from the financial institutions, offering in the share market, and issuing the corporate bonds.

After the introduction of background information of the market, the theoretical framework chapter and methodology chapter give the rules and theory guidelines that this study follows and the methods and models this study implements. The empirical part is the main contribution of this study. The data is collected from the valid and reliable resources, and the models are applied on the up-to-date data. From the calculation, we found out the cost of equity, the cost of debt, and total cost of capital in China. Furthermore, the calculation of cost of equity is extended into economy sector level, which gives deeper understanding of the cost of equity in different industries. The same processes have been duplicated to Norwegian market, and the results from Norwegian side have shown a higher cost of capital.

The financing costs consist of cost of capital and financing expenses. However, this study is mainly focusing on the cost of capital in both countries, and the financing expenses are believed as short-term costs that will die out in the long run. Moreover, the empirical data shows the financing expenses vary much across individual companies and different time period. Somehow, the financing expenses are not as comparative as cost of capital in this study.

Based on the empirical studies, the comparison and analysis chapter gives interpretation of empirical findings. The estimation of share riskiness in China is higher than in Norway. Nevertheless, the market risk premium in Norway is greater than in China and the market return rate in Norway is also higher than Chinese market return rate. As a result, the total cost of equity in Norway is much higher than in China. And the higher cost of equity finally gives the firms in Norway a higher cost of capital. Meanwhile, the consideration of inflation in different countries takes effects on deduction of the cost of capital in reality, and this is argued in the analysis part. The inflation is much severe in China, which is over the limit of Norwegian monetary policy allowance. Therefore in both overall level and each financing resource level, the financing costs in China are lower than in Norway.

Finally, from the study of all financing resources and their costs, optimal financing resource combination for the Norwegian investors is to get financed in China from corporate bonds or bank loans, or at least the stock market, and the best solution to achieve this goal is to establish joint venture in China with technology contribution.

7.2 Limitation of the Research

To any research, limitation exists. It is an inevitable feature of study because of limitation of the researcher and situation changes along the time. So this study cannot escape from having limitations both in the analyzing ability of empirical data and the accuracy of implementing certain research methods.

First limitation comes from the access to sufficient date of research topic. One of the components of financing costs is the financing expenses. But the empirical data of financing expenses show the shortage of sufficient data to illustrate how the financing expenses die out in the long run. And the study of cost of equity uses only three years' data may have biasness from the economy cycle.

And the data are mostly collected from the secondary data resource, even though they are official published, there is still a huge delay. Such as the statistic data on the financing expenses are published in 2001. Moreover, the validity of the empirical data is another concerning. Such as the inflation rate in China is widely questioned. In order to solve this type of problem, more studies of the circumstances should be performed.

At last, there are some limitations from the models we used in the study as well. Some of the models have unrealistic assumptions. Such as the perfect market assumption is not realistic in any economy. As well as the CAPM model assumes there is no transaction cost and the investors can borrow and lend any amount at a fixed risk-free rate. All of these assumptions make the results have differences from the realities.

7.3 Proposals for Further Research

According to the limitations in this study, the further research should solve the problem mainly in two areas that are the data collections and the model corrections.

Along with the disclosure of more information in Chinese market, the data of financing expenses will be more transparent throughout the whole fund raising process. Some interviews with the companies who recently pubic offered their stocks can obtain data in details rather than total amount published in the statistics. Collection of relevant data in the macroeconomic factors can verify or falsify the

claimed figures from the official publications as well. These in-depth data collection works can make the empirical data more convincing.

And the development of the financial models is a theoretical study that needs mathematical analysis and modeling skills. The ability of making a conclusive interpretation of the financial phenomena with abstract mathematic equations is very essential to accomplish this work. Along with more empirical data, for example, the research can study the scales of how much the return rate changes corresponding to the borrowing amount increases in the real market and integrate this factor into the models.

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Appendixes 1. Regression of Chinese Energy Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.902705293
R Square	0.814876846
Adjusted R Square	0.814620798
Standard Error	0.006246156
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.087255028**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.124163869	0.124163869	3182.508227	5.0535E-267
Residual	723	0.028207461	3.90145E-05		
Total	724	0.152371331			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000223687	0.000231988	0.964215463	0.3352603	-0.000231764	0.000679138	-0.000375457	0.00082283
X Variable 1	1.298319431	0.023014248	56.41372375	5.0535E-267	1.253136697	1.343502165	1.238881766	1.357757096

Appendixes 2. Regression of Chinese Materials Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.910885226
R Square	0.829711896
Adjusted R Square	0.829476366
Standard Error	0.005776632
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.085952669**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.117552171	0.117552171	3522.745781	3.8527E-280
Residual	723	0.024126129	3.33695E-05		
Total	724	0.1416783			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000169203	0.00021455	0.788640584	0.430580615	-0.000252012	0.000590417	-0.000384903	0.000723308
X Variable 1	1.263278965	0.021284263	59.35272345	3.8527E-280	1.221492625	1.305065304	1.20830924	1.31824869

Appendixes 3. Regression of Chinese Industrials Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.945733226
R Square	0.894411335
Adjusted R Square	0.894265292
Standard Error	0.003664336
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.078270764**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.082233505	0.082233505	6124.325869	0
Residual	723	0.009707979	1.34274E-05		
Total	724	0.091941483			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-0.000131915	0.000136097	-0.969275866	0.3327317	-0.000399108	0.000135277	-0.000483406	0.000219575
X Variable 1	1.056594481	0.013501412	78.25807223	0	1.030087827	1.083101135	1.021725108	1.091463855

Appendixes 4. Regression of Chinese Consumer Discretionary Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.876132567
R Square	0.767608274
Adjusted R Square	0.767286847
Standard Error	0.005812653
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.077899858**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.080687474	0.080687474	2388.126256	2.6196E-231
Residual	723	0.024427956	3.37869E-05		
Total	724	0.10511543			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000257959	0.000215887	1.194876274	0.232527184	-0.000165882	0.0006818	-0.000299602	0.00081552
X Variable 1	1.046615104	0.021416986	48.86845871	2.6196E-231	1.004568196	1.088662013	0.991302602	1.101927607

Appendixes 5. Regression of Chinese Consumer Staples Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.793707436
R Square	0.629971495
Adjusted R Square	0.629459699
Standard Error	0.006841664
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.071871436**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.057616576	0.057616576	1230.903522	3.0848E-158
Residual	723	0.033842444	4.68084E-05		
Total	724	0.09145902			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000315594	0.000254106	1.241978148	0.214647347	-0.00018328	0.000814468	-0.000340672	0.00097186
X Variable 1	0.884418175	0.025208421	35.08423467	3.0848E-158	0.834927729	0.933908621	0.819313736	0.949522615

Appendixes 6. Regression of Chinese Health Care Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.651813867
R Square	0.424861318
Adjusted R Square	0.424065828
Standard Error	0.008980053
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.067420409**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.043069591	0.043069591	534.0881114	6.53246E-89
Residual	723	0.058303702	8.06414E-05		
Total	724	0.101373293			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000365539	0.000333528	1.095977472	0.273453562	-0.00028926	0.001020337	-0.000495845	0.001226923
X Variable 1	0.764661651	0.033087416	23.11034641	6.53246E-89	0.699702764	0.829620537	0.679208554	0.850114747

Appendixes 7. Regression of Chinese Financial Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.894683256
R Square	0.800458129
Adjusted R Square	0.800182137
Standard Error	0.005394155
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.078782294**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.084389757	0.084389757	2900.29969	3.0388E-255
Residual	723	0.021037066	2.90969E-05		
Total	724	0.105426823			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	6.30839E-05	0.000200344	0.314877898	0.752945214	-0.000330242	0.000456409	-0.000454334	0.000580502
X Variable 1	1.070357378	0.019875011	53.85443055	3.0388E-255	1.031337753	1.109377002	1.019027253	1.121687502

Appendixes 8. Regression of Chinese Information Technology Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.794335259
R Square	0.630968504
Adjusted R Square	0.630458087
Standard Error	0.008409244
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.079489574**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.087417121	0.087417121	1236.182369	1.1622E-158
Residual	723	0.051127229	7.07154E-05		
Total	724	0.13854435			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.00028557	0.000312327	0.914329939	0.360848322	-0.000327607	0.000898747	-0.000521061	0.001092201
X Variable 1	1.089386999	0.030984245	35.15938522	1.1622E-158	1.028557164	1.150216833	1.00936565	1.169408347

Appendixes 9. Regression of Chinese Telecommunication Service Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.767712502
R Square	0.589382485
Adjusted R Square	0.588814549
Standard Error	0.008220595
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.075265799**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.070130123	0.070130123	1037.762689	6.9864E-142
Residual	723	0.04885903	6.75782E-05		
Total	724	0.118989153			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-4.03968E-05	0.000305321	-0.132309291	0.894776471	-0.000639818	0.000559024	-0.000828932	0.000748139
X Variable 1	0.975744781	0.030289159	32.21432429	6.9864E-142	0.916279575	1.035209987	0.897518594	1.053970968

Appendixes 10. Regression of Chinese Utilities Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.882149898
R Square	0.778188443
Adjusted R Square	0.777881649
Standard Error	0.005040603
Observations	725

Rf=	0.039
Rm=	0.0761673
Re=	**0.073765373**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.064447173	0.064447173	2536.523574	1.2583E-238
Residual	723	0.018369751	2.54077E-05		
Total	724	0.082816924			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-0.000121244	0.000187213	-0.647628054	0.517431134	-0.00048879	0.000246301	-0.000604749	0.00036226
X Variable 1	0.935375249	0.018572331	50.36391142	1.2583E-238	0.898913111	0.971837388	0.887409485	0.983341014

Appendixes 11. Regression of Norwegian Energy Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.941917173
R Square	0.887207961
Adjusted R Square	0.88705817
Standard Error	0.004162643
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.189734039**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.102631401	0.102631401	5923.003054	0
Residual	753	0.013047679	1.73276E-05		
Total	754	0.11567908			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	3.27395E-05	0.000151612	0.2159421	0.829091361	-0.000264894	0.000330373	-0.000358781	0.00042426
X Variable 1	0.948127756	0.012319579	76.96104894	0	0.923942951	0.972312561	0.916313992	0.97994152

Appendixes 12. Regression of Norwegian Materials Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.863720116
R Square	0.746012439
Adjusted R Square	0.745675138
Standard Error	0.008475849
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.230898351**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.158889439	0.158889439	2211.712113	2.7461E-226
Residual	753	0.054095534	7.184E-05		
Total	754	0.212984972			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-0.000197303	0.000308709	-0.63912467	0.522936198	-0.000803336	0.000408729	-0.000994505	0.000599898
X Variable 1	1.179707247	0.02508476	47.02884342	2.7461E-226	1.13046287	1.228951625	1.114929011	1.244485483

Appendixes 13. Regression of Norwegian Industrials Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.840175373
R Square	0.705894658
Adjusted R Square	0.70550408
Standard Error	0.006240976
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.160777697**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.070394228	0.070394228	1807.307117	2.6924E-202
Residual	753	0.02932919	3.89498E-05		
Total	754	0.099723419			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-0.000390707	0.00022731	-1.718830184	0.086056307	-0.000836944	5.55293E-05	-0.000977706	0.000196292
X Variable 1	0.785227062	0.018470527	42.51243485	2.6924E-202	0.748967214	0.82148691	0.737529251	0.832924873

Appendixes 14. Regression of Norwegian Consumer Discretionary Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.747956209
R Square	0.559438491
Adjusted R Square	0.558853415
Standard Error	0.009192297
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.17073468**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.080795813	0.080795813	956.1824497	3.6102E-136
Residual	753	0.063627236	8.44983E-05		
Total	754	0.144423049			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.0001927	0.000334803	0.575560849	0.565084004	-0.000464559	0.000849959	-0.000671888	0.001057287
X Variable 1	0.841242409	0.027205128	30.92219995	3.6102E-136	0.787835496	0.894649322	0.770988589	0.911496229

Appendixes 15. Regression of Norwegian Consumer Staples Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.626424066
R Square	0.392407111
Adjusted R Square	0.391600215
Standard Error	0.009477699
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.131153736**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.04368426	0.04368426	486.3166764	1.56971E-83
Residual	753	0.067639563	8.98268E-05		
Total	754	0.111323823			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000370871	0.000345198	1.074370598	0.283000761	-0.000306795	0.001048537	-0.00052056	0.001262302
X Variable 1	0.618570525	0.028049792	22.05258888	1.56971E-83	0.563505436	0.673635614	0.546135468	0.691005583

Appendixes 16. Regression of Norwegian Health Care Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.427201393
R Square	0.18250103
Adjusted R Square	0.181415374
Standard Error	0.012251512
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.104764866**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.025232045	0.025232045	168.1020781	7.61486E-35
Residual	753	0.113024953	0.0001501		
Total	754	0.138256998			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-4.45944E-05	0.000446227	-0.099936569	0.920421284	-0.000920591	0.000831402	-0.001196919	0.00110773
X Variable 1	0.47011375	0.036259049	12.96541855	7.61486E-35	0.398932908	0.541294591	0.376479318	0.563748182

Appendixes 17. Regression of Norwegian Financials Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.765330376
R Square	0.585730584
Adjusted R Square	0.585180426
Standard Error	0.010863986
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.207684051**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.125657492	0.125657492	1064.657716	3.063E-146
Residual	753	0.08887372	0.000118026		
Total	754	0.214531212			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000374131	0.00039569	0.945515295	0.344699161	-0.000402656	0.001150917	-0.000647689	0.00139595
X Variable 1	1.049109756	0.032152587	32.62909309	3.063E-146	0.98599039	1.112229122	0.966079746	1.132139766

Appendixes 18. Regression of Norwegian Information Technology Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.644032052
R Square	0.414777284
Adjusted R Square	0.414000095
Standard Error	0.009534673
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.137077114**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.048517715	0.048517715	533.6896294	1.12229E-89
Residual	753	0.068455217	9.091E-05		
Total	754	0.116972932			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-4.39191E-05	0.000347273	-0.126468427	0.8993949	-0.000725658	0.00063782	-0.000940709	0.000852871
X Variable 1	0.651893876	0.028218409	23.10172352	1.12229E-89	0.596497772	0.707289981	0.579023387	0.724764366

Appendixes 19. Regression of Norwegian Telecommunication Service Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.700025942
R Square	0.49003632
Adjusted R Square	0.489359077
Standard Error	0.010064913
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.163629359**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.073300011	0.073300011	723.5757423	3.2079E-112
Residual	753	0.076280761	0.000101302		
Total	754	0.149580772			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	0.000400249	0.000366586	1.091829717	0.275257166	-0.000319403	0.001119901	-0.000546413	0.001346912
X Variable 1	0.801269757	0.029787685	26.89936323	3.2079E-112	0.742792976	0.859746538	0.724346809	0.878192705

Appendixes 20. Regression of Norwegian Utilities Sector

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.341154538
R Square	0.116386419
Adjusted R Square	0.115212961
Standard Error	0.008287745
Observations	755

Rf=	0.0212
Rm=	0.198954567
Re=	**0.064621152**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006812518	0.006812518	99.18246549	4.94278E-22
Residual	753	0.051721102	6.86867E-05		
Total	754	0.05853362			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 99.0%*	*Upper 99.0%*
Intercept	-0.000139639	0.000301858	-0.462598093	0.64378612	-0.000732221	0.000452944	-0.000919148	0.000639871
X Variable 1	0.244275875	0.024528056	9.959039386	4.94278E-22	0.196124374	0.292427376	0.180935257	0.307616493