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Chinese Financial Market Development and Risk Management in Banks

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This study is to examine China's financial market and its current risk management status and to aid various financial institutions' efforts in strengthening the nation's credit scoring and asset management disciplines by exploring the potentials of implementing advanced corporate credit risk evaluation systems.

Chinese banks, which constitute over 78% of the total Chinese financial market, are still dependent on deposit-loan margin structures. Thus there are elements that call for improvements in the overall credit risk management operation. Their credit evaluation system including corporate failure prediction, which is axial in the credit rating and post management process, should be designed as a part of a comprehensive evaluation system, taking consideration of each institution's evaluation purpose, usage and the current management system.

To foster and strengthen its financial industry, China should focus on implementing a modern financial system that shifts from quantitative expansion to qualitative improvements. It is also urgent that the financial system and practices meet global standards for the structuring and modernization of a corporate credit evaluation system that is specific to China.

Key Words: Chinese financial market, risk management in banks, corporate credit evaluation, Chinese corporate failure prediction system

I. Introduction

Through efficient asset distribution and management, China has been exerting

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diverse efforts to resolve problems associated with planned distribution of resources during the past economic development process including inefficient investment and financial institutions' non-performing assets. Furthermore, the nation is continuing such efforts in reform to enhance corporate and financial institutions' competitiveness as well as to achieve sustainable growth.

Since the initiation of reform and opening of its financial market in 1978, China's direct financing market has shown comparably rapid growth. Yet, the banking industry, or the indirect financing market, still holds important position with over 78% market share of the entire financing market as of 2007. The primary business model of such banking industry still relies on the old fashioned profit through loans (over 90%) and increased margin through enhanced risk management in credit related financing is being recognized as an important necessity. Notably, the exorbitant growth of new loans in 2002 also signifies the high increase in risk and therefore, appropriate evaluation process including objective credit evaluation of the client as well as performance measurement had to be followed.

During the early stage, the main problems at the national banks were that there were no clear personnel specifically responsible for the management performance and no clear authority assigned. Furthermore, the Check & Balance System[1)] for the underwriting process and loan's post management of loans were very poorly established and transparency in management was highly inadequate. Therefore, continuous enhancement efforts such as encouraging competition for improved risk management and reorganizing the corporate structure to a stock ownership structure have been made but no significant result has yet been achieved.

This study seeks to focus on such points and conduct research from the following three perspectives.

1) The Relationship Manager, who aggressively provides information, loan approval decision, management consultation and other solutions directly to the client and the Credit Officer, who is responsible for corporate analysis and evaluation to minimize risk, both closely support the client from different perspective. Such decision making system of the bank is known as the Four Eye's Rule or the Check & Balance System. (page 3)

First is to examine the management related issues as well as their necessity for improvements through increased understanding of Chinese financial institutions' risk management by reviewing prior researches.

Second is to provide effective loan evaluation system as well as healthy asset structure for China's financial institutions by closely studying leading banks' risk management systems as well as the credit risk evaluation systems of client corporations.

Third, as the world has experienced through the subprime mortgage crisis in America, risk management is now a global issue. Therefore, this study aims at establishing a joint cooperative basis among financial institutions in Asia for mutual growth and advancement.

Unlike the macro oriented researches conducted thus far on the Chinese financial industry, this study focuses on the practical aspects. Other than the prior research report, "The Effects of Working Environment of the Chinese Banks on the Risk Evaluation and the Establishment of Early Warning Model",[2] there is not much available data. Thus the study is conducted based on evaluation experience and advanced theories with efforts placed to enhance the applicability of this study in the actual Chinese financial industry.

In regards to the risk management theory structure, advanced nations' risk management research reports are referenced. As for the status of risk management in Chinese financial industry, Chinese, Korean, and American publications are reviewed. For advanced corporate credit evaluation system and analysis methods as well as modeling corporate failure, prior researches and actual case examples in America and Korea are reflected.

When reviewing the past cases of government's financial pressure in various

2) China's Yan Guang Ming (2005) has included in the *Research on Chinese Banking Industry's Risk Evaluation & Warning System* the effects of overall conditions, such as bank's work process system, credit, economic growth policy, and government intermediation, on bank risk. (page 4)

countries during the economic development process as well as Korea’s experience in the 1997 foreign currency crisis (known in Korea as the IMF Crisis) and their advancement in risk management in light of such experience, now is considered to be the most appropriate period, since the opening of China’s financial market in 2007, for modernizing loan evaluation system and early warning system for non-performing loans. As a result, application of actual case examples of Korea seems to be most effective. In addition, with the recent increase of insecure factors in the international financial market, strengthening of overall risk management in financial supervisory, corporate, and financial institutions in all nations has become a must for all nations. Therefore, the need for global risk management cooperation as well as measurements has been recognized as highly important. Accordingly, this study reviews the theoretical structure of risk management and the statuses of Chinese financial market's growth and risk management in Chapters 2 and 3. In Chapter 4, leading financial institutions' corporate credit rating model, corporate under-performance forecasting model, and other credit risk management's modernization process is detailed. In Chapter 5, this study seeks to identify ways to utilize the advanced systems of Chinese financial institutions as well as to review areas for advancement and finally, Chapter 6 will summarize the results of overall research conducted.

II. Theoretical Structure of Risk Management

1. Concept of Risk & the Objectives of Risk Management

The financial industry has transformed to a risk management industry in recent years and the survival of financial institutions has now become dependent on the ability to maintain appropriate risk level and gain profits through efficient risk management. The meaning of risk speaks of the possibility of difference than at first expected so it includes both possibilities of being better or worse than at first expected. (Kim, Understanding Risk, 2007). In addition, it also means the improbability or possibility of an unexpected result (accident) and the result of certain cases exceeding the probable expectation value is measured via dispersion or standard deviation. (Korea Development Bank, Risk Management, 2007). When expressed in financial engineering terminology, it can be stated as Risk = (Probability of an Accident) × (Loss per Accident).

Risk is largely categorized into credit risk, market risk, interest risk, liquidity risk, and operation risk. Credit risk speaks of possibility of loss caused by inability to collect loans under normal conditions due to client's default. Market risk speaks of the risk associated with loss caused by unfavorable market conditions such as stock prices, interest rates, and FX rates. Interest risk is the possibility of depreciation of bank's net income through interest or net asset value caused by unfavorable interest rate changes. Liquidity risk is the possibility of abnormal losses caused by obtaining funds at high interest rate or forced liquidation or sale of assets at unfavorable terms to avoid default in debt payment. Operation risk is the possibility of losses caused by inefficiency, poor internal operation process, employees, system, or external factors. Largely, the operation risk covers all risks other than credit, market, interest, and liquidity risks. The subcategories of the operation risk based on the source of the risk are human risk, work handling risk, information system risk, external risk, and natural disaster risk.

It is important for financial institutions, especially banks, to recognize the significance in adequate management of acceptable margin of risk as well as income associated with risk control. In other words, the banks must carefully examine the profit making opportunity together with its associated risks and maximize the banks' value through optimized risk-return portfolio. To achieve this, excessive or unacceptable risk needs to be hedged or reduced. However, if the risk is too minimal as a result of extremely conservative marketing practice, than it must be raised to an optimal level and risk-taking balance must be maintained. (Refer to [figure-1])

The objective of risk management is to maintain the risk within a manageable level

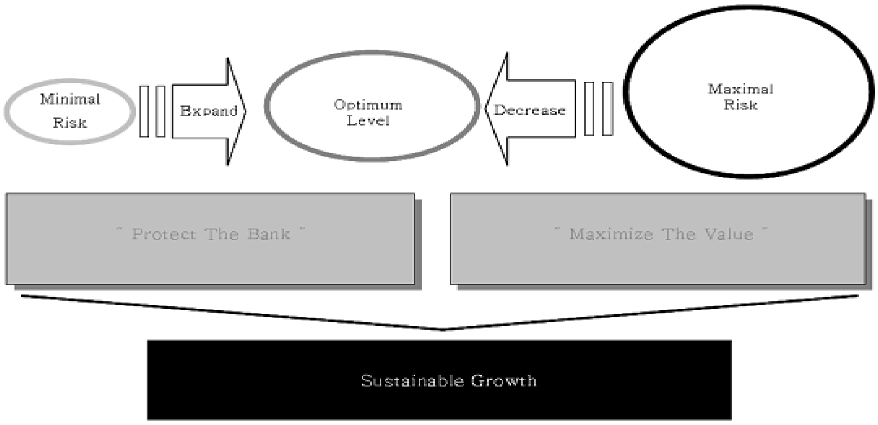


Figure 1. Financial Institution's Risk Management Direction[3)]

by its own asset and to protect the bank while maximizing the Risk Adjusted Return on Capital (RAROC). When viewing the changes in risk management through balance sheet and profit and loss statement, in the past, managing from balance sheet perspective included Asset & Liability Management (ALM), which includes asset management as well as acquiring capital for income through capital management. More recently, however, it has changed to risk capital management with consideration to existing risks. This signifies that a bank is not completely eliminating the risk in the process of acquiring capital or operation but it must sometime accept risks while avoiding others depending on the condition. It means that banks must appropriately control the level of risk taking in line with the changes in market environment to the extent of not damaging the soundness of overall management. When viewing from profit and loss statement perspective, it has changed from the previous simple income management from operation of capital to risk controlled income on invested capital. Accordingly, there is a necessity to create systematic preconditions in risk management culture. Within the organization, a clear role of performance and authority for the process of precisely measuring the risk value and evaluating the business performance based on calculated risk must be established while the sales, risk management, and

3) Industrial Bank of Korea (2007), *Risk Management*, Page 8. (figure 1).

internal regulation must be departmentalized.

2. Corporate Credit Risk Evaluation Structure

The credit risk, recognized as the biggest risk to financial institutions, usually is attributed to the default by corporate clients. Consequently, the corporate evaluation became a key factor in banks' risk management.

A company utilizes its strengths in the existing policy and business environment to acquire a competitive edge through innovative strategies and improve performance by implementing such strategies. Such decision process for implementing strategies is separated into acquiring capital, investment, and marketing activity sectors and their results are reflected in the company's financial statement in accordance with its accounting policies. Of course, when the capital market is efficiently running, the financial statement related information will quickly be evaluated by rational investors and become reflected on the company's stock price. (Refer to [figure-2])

In general, the loan, guaranteeing, investment, and other credit related risk and corporate performance evaluation methods employed by banks include credit check, business feasibility study, and company diagnosis. As for the analysis methods, there are financial statement analysis and review of principal repayment possibility based on the cash flow. Credit check and business feasibility study is conducted as the loan's pre-approval process and credit rating review, and company diagnosis is conducted as post loan management and as a part of client company rationalization service. Such variety of business analyses comprehensively reviews and evaluates the overall factors that affect the repayment of principal and interest on loan obligations as per the loan agreement. Therefore the analyses make a key contribution in determining the amount of credit lines, interest rates, and fees.

Here, credit check includes reviewing the past and present operations, financial transactions, financial condition analysis, and executives' experience and qualification analyses. The review of business feasibility consists of technical, economical, and

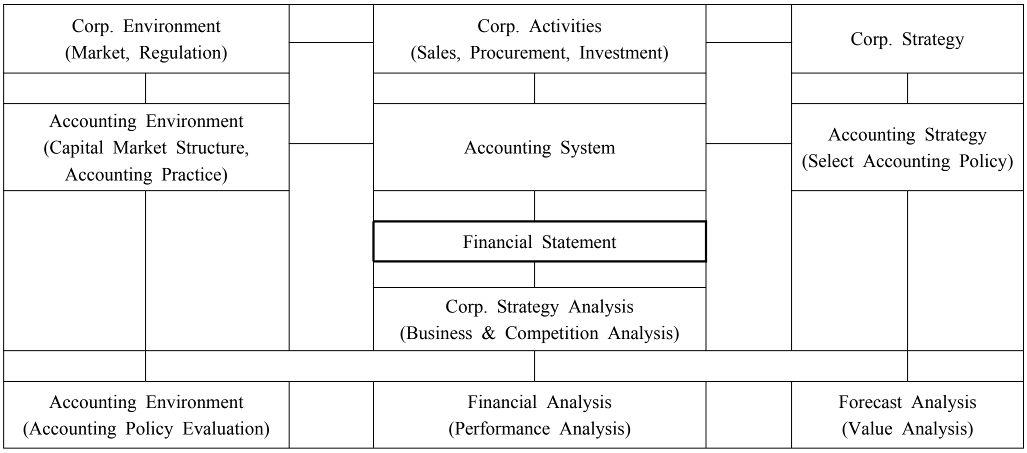


Figure 2. Relationship between Financial Information & Corporate Credit Evaluation[4)]

financial analyses to determine the soundness of the business venture. The reviewing process also includes forecasting the company's income, expenditures, cash flow, and the ability to repay the principal and interest (or corporate value). When viewing from the underwriter's perspective, credit analysis is the initial process of reviewing business feasibility which is directly related and cannot be separated.

The business feasibility review conducted by banks is conducted to minimize major losses or overdue payment and to maintain the soundness of banks' assets. It is considered as one of the most integral part of the loan approval process. The process presents the business's weakness, risk factors, and countermeasures and provides initial data for corporate management decisions and review by the financial institutions. Business feasibility review must include: ① strategic points such as new business's management strategy, its appropriateness, success rate, and attractiveness; ② ability to actualize the business, as well as financial perspective for analyzing financial and economic points of market condition of new business, profitability, and competitiveness. For business actualization capability review, technical analysis must

4) Refer to K.G. Palepu, P.M. Healy, V.L. Bernard (2000), *Business Analysis and Valuation*, (figure 2).

be performed on the company's business management ability, product, facility plan, and production plan as well as the appropriateness of required capital and the company's ability to acquire financing. For economic and financial review, first industrial analysis including macro environment, industry status, and competitive environment as well as market position and review of marketing effectiveness must be conducted. Furthermore, revenue forecasting by analyzing expected demand, profitability and cash flow as well as competitiveness must be scrutinized to determine the planned business's feasibility. To increase the reliability of the forecasted results, risk analysis including sensitivity analysis must be conducted.

As shown above, the end interest in corporate credit risk evaluation is the financial information, notably, the company's performance analysis conducted with financial statement. However, the company's accounting policy may be distorted depending on the objective of the top management who has the internal information. Therefore, an evaluation based on accounting principal must be conducted. Above that, the corporate analysis is just a comprehensive analysis of the corporate performance level from various angles based on the financial information. To this end, it is essential to evaluate the company's actual strategy, business, and sector based on the environment and business analyses which must be linked with financial statements to determine the stability, profitability, production capability, efficiency, and growth capability.

III. Status of China's Financial Market's Growth & Risk Management

1. China's Financial Market's Development Process

Prior to the reform and opening of China's financial market, the Chinese financial system was used as a tool for developing socialistic government.

From the birth of the People's Republic of China in 1949 until the acceptance of a socialist market competition system in 1978, China established the People's Bank of China nationwide and merged all the banks in former communist districts. The government closed all government funded banks and restructured private fund banks, individual bank branches, deposit trust companies, and insurance companies and placed all financial loan related activities under the government control.

As a result, during the initial stage of the planned economy when heavy industries were being focused, the People's Bank of China became the nationwide credit loan, settlement, and cash circulation center and became the nation's core institution which acted as China's accounting institution as well as the body controlling all corporations in China. In other words, the financial structure guaranteed concentrated investment in heavy industries.[5)]

However, such strategy created distorted industry structure and weakened cooperative mechanism for industrial growth. The unified ownership structure restricted economic activities and settled a dual economic structure of urban-agricultural regions. This resulted in a lower urbanization level and restricted the mutual growth of urban and agricultural regions, interfering in the positive growth of social economy. In particular, the unreasonable distribution of production factors, labor, and capital resource highly obstructed the economic efficiency. The economic structure which favored unified priority in the heavy industry sector lowered the agricultural surplus which interrupted the source of accumulation. With the sign of abuse of the macro system, the economy's operation clearly lost efficiency and as a result, micro management efficiency also deteriorated. Also with closed economy, profits through open type growth were practically none existent.

In relation to this, Deung Xiaoping emphasized the importance of a market oriented financial reform at the 11th 3 Party Meeting in 1978 and to specialize the functions of the Central Bank, the People's Bank was made independent under the Ministry of Finance while the Agricultural Bank of China was reinstated in 1979. In addition, the

5) Li Ming Xing (2005), *China's Economic Strategies*, page 42 and Hong, In-Ki (2006), *China's Latest Financial Market Theory*, page 193. (page 11)

Bank of China was spun off from the People's Bank and the National Foreign Exchange Division was newly established. China International Trust Investment Company and the China Investment Bank were established and the People's Insurance Company was reestablished. Then in 1983, China Construction Bank became independent from the Ministry of Finance to become a commercial bank specializing in fixed asset investment and loan business. In 1984, Industrial and Commercial Bank of China was newly established and took over the commercial and industrial savings and loan business. As a result, four basic foundations of the banking industry were established with the Industrial and Commercial Bank of China, the Agricultural Bank of China, the Bank of China, and the China Construction Bank. These four banks, together with the Central Bank, created a two-tier banking structure with the central bank controlling the capital by utilizing the legal reserve and the inter-banking bond market while the four specialized banks became the state-owned independent commercial banks of today.

In addition, China has implemented the Kyu Gyong Dae (揆改貸),[6] which switched the source of funding of government-owned businesses from governmental funds to bank loans in 1985 as per separation of finance and management. In 1986, a bank holding company system was established. From 1987 to 1992, with the start of the Transportation Bank of China reorganizing as a stock company, many commercially incorporated banks were established. During the Chi Ri Jung Don Gi (治理整頓期)[7] period from 1988 to 1991, financial reform gained momentum with sudden inflation and the financial resource returned to direct distribution. At this time the central government as well as the regional governments and district government institutions became the major shareholders of these banks.

With such background, bank assets were recognized as national assets and any bank

6) Kyu Gyong Dae (揆改貸) is a policy which switched the unconditional fixed capital investment support of government owned businesses to bank loans. (page 13)

7) This was the period when as a side effect of rapid reform, consumer price skyrocketed and income gap became serious, resulting in onset of social defiance. As a result, the Chinese government veered the economic policy from growth to adjustment. (page 14)

fund invested for economic development was widely accepted as governmental funds that did not need to be repaid. As a result, the combined practice of commercial and government policy related banking businesses became the unique characteristics of the government as well as the incorporated banks of China.

Thereafter, trust investment companies, financial companies, leasing companies and stock brokerage companies as well as other non-banking financial institutions achieved significant growth. Between 1990 and 1991, stock exchange centers were established in Shanghai and Shenzhen. In addition, investments by Chinese residing at overseas together with foreign investments joined to establish joint venture banks and started to make limited advancement under the financial structure.

Starting with the Great South Tour[8] by Deung Xiaoping in early 1992, commercialization and advancement of financial structure was aggressive pursued. In December 1993, the Chinese State Council announced decision pertaining to financial system reform and advanced foreign exchange management system and set forth four objectives.[9] ① Powerful macro regulation by the central bank and establishment of a regulatory system ② Implementing separation of policy oriented finance and commercial oriented finance and establishing financial organization structure where diverse financial institutions mutually exist centered around the state owned commercial banks ③ Establishing open, competitive, and strictly managed financial market ④ Reforming the foreign exchange management system and balancing the policies pertaining to foreign exchange and currency. Accordingly in 1994, China established three government banks, the China Development Bank, the Export-Import Bank of China, and the Agricultural Development Bank of China, to separate specialty

8) As the Chinese economy veered away from planned rapid growth since the Tiananmen Square Crisis, Deung Xiaping toured South China from January 18, 1992 to February 21 and emphasized the importance of reform and open economy in series of speech. As a famed speech which emphasized planned policy or market logic, it doesn't matter as long as it results in favor for the people. The 'Establishment of Socialist Market Structure is the Objective of China's Financial Reform' became the heaven's mandate as well as the ultimate ideology of communism. (page 14)

9) Li Ming Xing (2005), *China's Economic Strategies*, page 104. (page 14)

banking from policy related banking.

In addition, with the official enactment of the People's Bank of China Law and the Commercial Banking Law in March 1995, the People's Bank of China commenced its independent currency policy and supervisory service and the state-owned specialty banks became state-owned independent commercial banks, whose stocks became listed in the stock exchange. Here, the four major state-owned independent commercial banks handled commercial services as well as policy related services since 1984. After the foreign currency crisis in Asia in 1998, the government issued special treasury bonds in the amount of 312.3 Billion Yuan and over 1.4 Trillion Yuan in non-performing debt was distributed to four asset management companies established by the four major commercial banks in order to supplement Authorized Capital.

Securities Law of the People's Republic of China implemented in July 1997 established the regulations for securities market and started off the advancement of the people's economy by optimizing resource arrangement, regulating the financial structure, and efficiently distributing social capital. In November 1998, Insurance Supervisory Board of China was established. Based on the legislature and regulations, it commenced unified supervisory and management of the insurance market across the nation.

As shown in [figure 3], the People's Bank of China's policy related finance and commercial finance is separated by the central bank. Led by the state-owned commercial banks, diverse financial organization structure is formed where stock issuing incorporations and regional commercial banks, investment trust companies, corporations and various other financial institutions coexist.

Upon joining the WTO in 2001 and fully opening the financial market in 2007, the Chinese government, in order to maintain stable and sustainable growth, considered the third industry. In addition, the government has been actively promoting strategic alliance with foreign financial institutions as well as IPO[10] participation and M&A to

10) Initial Public Offering (IPO) is a process of listing a company's stock on the stock exchange and making its financial information available to the public. This allows the company to acquire

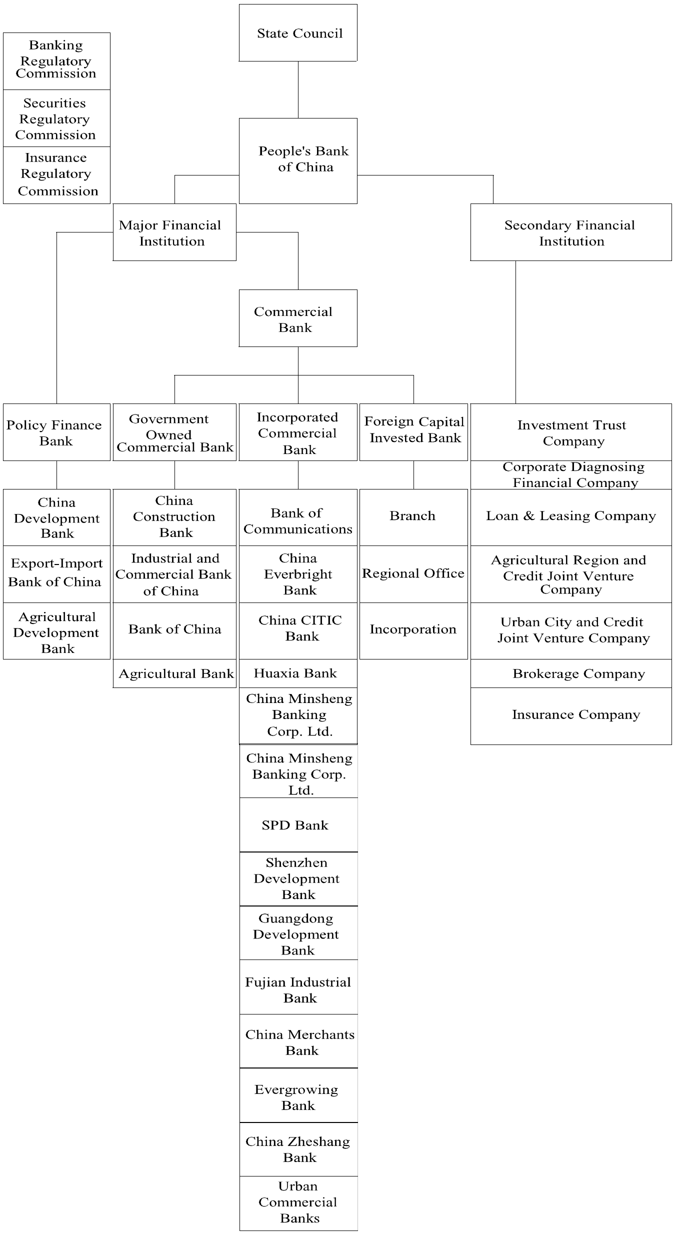


Figure 3. China's Financial Institution Structure[11]

capital and the public to purchase the offering company's stocks. (page 15)

11) Lee, Yoon-Woo (2006), "China's Financial Reform and the Efficiency of Banks Compared with Korea and Japan," page 77 Up-date. (figure 3)

import advanced management techniques and risk management system.

In addition, the financial environment of China requires the traditional individual deposit oriented capital lent to major corporations to transform in line with the recent increase of consumer credit as well as loans to small and mid sized businesses through the recent rush of foreign capital. It must also establish win-win strategic alliance and import credit evaluation system, risk management system, new financial product, improved customer service, and enhancement of professionalism from advanced financial institutions.

Accordingly, the Chinese government has been pursuing bank's capital structure reform, corporate governance, profit oriented management, and implementation of western capitalistic management style in order to resolve the problems associated with a massive scale non-performing debt as well as loosened organization and inefficient human resources resulting in low productivity and other negativities in the financial industry.

2. Status of Chinese Financial Institutions' Risk Management

Although the capital market in China has achieved comparatively rapid growth since the financial reform and opening of the financial market, the indirect financial market, or the banking system, still holds a key position with the overall financial market share reaching 78.9% (Refer to 〈chart 1〉). In addition, even with an emphasis in competition and switching organization structure to stock issuing incorporation, the banking service is still dependent on margins on savings and loans (over 90%) with a simple loan income structure. Therefore, there is a necessity for income management through continuous advancement of credit risk management for credit loans.[12] Especially since 2002, with the usage of foreign short term hot money, which

12) Refer to Yuan Zhi Gang's "Qualities of Financial Policy Reform and China's Economic Growth" presented at the Korea-China International Forum sponsored by Sungkyunkwan University and Samsung Economic Research Institute on May 10, 2006. (page 16)

〈Chart-1〉 Foreign Capital Amount & Ratio in Chinese Corporations

	Amount (100 Million Yuan)			Ratio (%)		
	2005	2006	2007	2005	2006	2007
Total	30677	39874	49705	100	100	100
Bank Loan	24617	32687	39205	80.2	82.0	78.9
Treasury Bond	2997	2675	1790	9.8	6.7	3.6
Corporate Bond	2010	2266	2178	6.6	5.7	4.4
Stocks	1053	2246	6532	3.4	5.6	13.1

Source: "Chinese Currency Policy Implementation Report" People's Bank of China (2005-2007).

provided abundant liquidity, the increased new loans including mortgage loan or automobile financing may have reduced the non-performing debt ratio in numeric value. However it may have spun a new load of potential default debt in the long run.

At the IIF Spring Membership Conference[13] held in Shanghai in April 2004, the Minister of the People's Bank of China pointed out that the major portion of the responsibility for large scale non-performing debt among four major banks of China did not lie with the state owned banks but lied with the government with its excessive intervention in banking activities, insufficient legal policies, and inappropriate customer management centered on state-owned businesses. Based on such background, China has implemented financial market reform since the Asian foreign currency crisis and removed the government intervention in the final loan approval phase and also the obligations to provide loans to government-owned businesses. In addition, the government-owned businesses also have undergone restructuring and reformation, resulting in management improvement. Furthermore, the enactment of bankruptcy law which strengthened the investor's rights, together with securities exchange law and corporation law, is making positive effect on resolving problems associated with

13) The Institute of International Finance was established by major private banks in Europe, America, and Japan on January 1983 to promote cooperation among banks regarding Central America, Middle East and other developing countries' loan related problems. It's headquarter is in Washington D.C. and its primary objective is to centralize the various financial and economic data pertaining to borrowing nation in one location and provide the analyzed data to branch banks. (page 16)

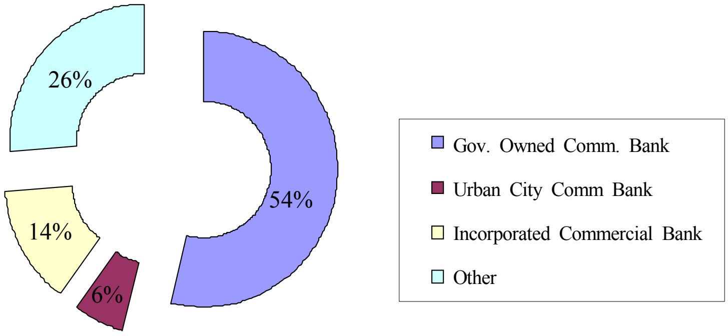
non-performing debt.[14]

Citibank's William Rhodes stated that China must improve the current lending process and change its unique credit culture in order to resolve China's non-performing debt related problems in the Financial Times, January 2005 issue.[15] He also emphasized that a credit related risk management system needs to be established to organize a loss and depreciation process. In addition, credit and risk management personnel needs to be thoroughly trained, on top of strict internal audit, establishment of Check & Balance system, board review on the audit result, and reports to an independent management body. As the basis of such suggestion, state-owned banks' endless scandals and fragile risk management system can be pointed out (Yao, 2007). In particular, in order to transform and advance as a sound financial market, essential step is to remove risks associated with sudden increase of new loans to government-owned corporations, excessively inflated real estate market and increase in real estate loans, and continued excessive investment in a single company which already surpassed the safe investment limit.

Even now, the Chinese economy is based on a sharing system and although there is freedom in management, the central government or the regional government remains the major shareholder so that more transparency is needed in credit and customer management. In any country, it is a known fact that finance is used as a means for economic development. However, it must grow in balance with the actual economy. So, together with economic growth, policy, management method and management system must continuously improve as well. Especially, as shown in [figure 4], improving the sound management of assets possessed by the four major state-owned commercial banks, which control over 50% of the banking industry, is highly important (Zhou, 2007).

14) Hong, In-Ki (2006), "China's Latest Financial Market Theory," page 343. The new bankruptcy law enacted in 2005 reinforces the lender's rights and is evaluated to be an important cornerstone towards transformation into market competition oriented structure. (page 17)

15) Refer to January 5, 2005 issue of *Financial Times*, 'William Rhodes' Beijing must press on with its banking agenda.' (page 17)



Source: China Bank Regulatory Commission (CBRC) Sep. 2007.

Figure 4. Ratio of Capital Among China's Banking Industry (2007)

The banking industry of China is currently at a historic transition point from the risk perspective.

Since the full opening of the financial market in 2007, the Chinese banks entered into actual competition with foreign banks. The four major foreign capital banks, HSBC, Citibank, BEA, and Standard Chartered Bank, officially commenced the banking business as of April 23rd and are forming competitive pressure on Chinese banks. Major changes are expected from service perspective. The Bank of China's Vice Minister Zhu Min has stated that the Chinese banking market has already transformed as the global banks' strategic market and forecasted that within the next five years, the foreign capital banks' market share will increase to over 10%.[16)]

The total asset size in the banking industry increased significantly from 23.6 Trillion Yuan in 2002 to 48.5 Trillion Yuan by the end of June 2007. The number of banks meeting an 8.0% capital adequacy ratio as of end of 2003 was at eight or 0.6%, but increased to 78 or 76.4% by 2006. Major commercial banks' non-performing debt ratio in 2002 was 23.6% but improved to 8.98% by June 2007. Various incidents as

16) KOTRA, Guǎngzhōu Trade Center "Chinese Banking Industry Commences Competition with Foreign Banks" (April 30, 2007). (page 18)

of the end of 2005 numbered 1,274 but reduced to 1,085 in 2006. Since the construction of Communication Bank and the Development Bank, the Bank of China and the Industrial and Commercial Bank successfully completed IPOs in both Chinese and foreign stock exchanges. Based on market capitalization, the Industrial and Commercial Bank, the Bank of China, and the Development Bank becomes three of the ten largest banks in the world. Although success was achieved, on the flip side, it created surplus liquidity, currency inflation, non-performing real estate loan, and other problems associated with growth, including lack of growth period and experience, irrational financial structure, and low direct investment ratio were recognized as problems that must be resolved.[17)]

Accordingly in 2007, in commemoration of the 4th anniversary of CBRC, the Chinese financial regulatory body responded to the socialist market competition structure and established financial structure based on openness and competition. The Commission is exerting efforts to establish a growth mechanism organically merging the currency market, capital market, and insurance market. Furthermore, the Commission is also exerting efforts in forming a sound financial environment so that the financial market will actively implement asset distribution functions for system risk prevention.

The following is the review of credit risk management policies utilized in leading financial institutions. The purpose is to consider the soundness of China's bank assets as well as to lead the businesses to strengthen their competitiveness.

17) Chinese Embassy in Seoul, Korea, Economy and Finance Center "Growth Status of Chinese Financial Industry and Evaluation" — based on published data by the China Banking Regulatory Commission (October 2007). (page 19)

IV. Modernization of Financial Institutions' Credit Risk Management Policies

1. Credit Scoring Model of Leading Financial Institutions

Most of the leading financial institutions utilize a credit scoring model for credit risk analysis for credit loan decision. The credit scoring model comprehensively considers financial ratio and quality factors and provides important basic data for determining loan approval and other specific conditions. For better understanding of the credit scoring model, an example model used at Bank A is shown below in 〈chart 2〉.

The credit scoring model of Bank A mainly consists of a financial model and a non-financial model. The financial model is developed per company size and business type. As for evaluation variables, appropriate financial ratio (10~14) per company size and business type of pertaining company are used. Primary financial ratios used are debt ratio, dependence on successive deposits, total cash flow/debt, total ordinary income on capital, retained earnings/total capital, EBITDA/short term loan, and financial cost/liabilities. Bankruptcy rate is determined by inputting financial variables selected per company size and business type into the logit model. The financial score is obtained by multiplying 「1-derived bankruptcy rate」 by 100.

The non-financial model is composed of evaluation factors for identifying the ability to repay the loan, sales and marketing abilities, industry outlook, as well as the capacity for capital acquisition and management. 〈chart 3〉 shows the examples of evaluation categories used in the non-financial model.

After scoring the non-financial categories, weighted average per category will be applied and totaled to obtain the non-financial score. By combining the afore tallied financial score with the non-financial score in accordance with pertaining weighted

〈Chart 2〉 Example of Credit Scoring Model[18)]

Analysis Stage	Details and Methods
1: Financial Model	· Sectional Evaluation per Company Size: External Audit Required Total asset above ×× Total asset below ×× · Detailed Business Category · Financial Model Evaluation Variable: Utilizes financial ratio appropriate per company size and business type · Financial Scoring: Transform the rate of bankruptcy obtained through logit model to evaluation score *Financial Evaluation Score = [1-bankruptcy rate] × 100
2: Non-Financial Model	· Sectional Evaluation per Company Size: External Audit Required Total asset above ×× Total asset below ×× · Detailed Business Category · Evaluation Category: Ability to repay the loan, sales and marketing ability, industry outlook, ability to acquire capital, management ability, and business reference are evaluated · Non-Financial Evaluation Scoring: weighted average is applied to each points earned category and totaled (possible score = 100) *Non-Financial Score = $\sum$wi × Xi (w=weighted average, X=quantitative value of category rating)
3: Combining Models	· Total score is obtained by combining values from financial and non-financial models *Total Score = financial model score × financial weighted average + non-financial model score × non-financial weighted average
4: Pre-Rating	· Pre-rating is determined in accordance with total score
5: Rating Adjustment, Maximum Limit	· If a category with unsatisfactory score is found, then rating will become limited and if the underwriter identifies supplementary risk factors to consider, such will be reflected on the rating
6: Final Rating	· After rating adjustment, final rating based on the pre-rating will be determined

18) A Financial Institution (2007), *Business Analysis*, Financial Statement Analysis & Corporate Valuation (Kim, Kwan-Joong and Kim, Moon-Cheul, 2007), pages 477-478 (chart 2)

〈Chart 3〉 Example of Non-Financial Evaluation Category

Category	Detailed Evaluation List
Ability to Repay the Loan	· Forecasted revenue growth rate, forecasted ordinary income from sales, forecasted dependence on debt
Sales & Marketing Ability	· Stable Procurement: Purchase price trend, purchase negotiation ability, procurement source diversity · Production/Operation Efficiency: Factory operation rate, technology and quality level, work site operation, etc. · Sales Stability: Location condition, sales price trend, customer credit rating, customer diversity
Industry Outlook	· Industry prospect, average bankruptcy rate in the industry
Ability To Acquire Capital	· Capital increase plan and ability, ability to acquire loan, funding pattern
Management Ability	· Top management's experience and capability, management stability, relationship with union, etc.
Business Reference	· Business ability, financial transaction history, corporate note transaction history, average savings account balance

average, pre-rating is made. Then prior to determining the final rating, qualitative evaluation by the underwriter must be conducted. If unsatisfactory factors, which were not identified during financial and non-financial evaluations, are identified, then they shall be reflected on the final rating. In addition, other factors that may affect the company's ability to pay back the loan shall be considered and reflected in the final rating. The final rating derived through the credit evaluation model is used as an important basic data for determining the approval, interest rate, and maximum loan amount for credit loans.

2. Corporate Failure Prediction System

Corporate failure prediction system, which is an evaluation factor in financial evaluation of the credit evaluation model, becomes the core in credit analyses.

Bankruptcy as a result of corporate failure is a measure of enhancing the efficiency of the overall economy by removing the inefficient companies through the Survival of the Fittest principle. If such can be predicted, an effective countermeasure can be prepared to obtain favorable economic results. Especially in the case of banks, it is a factor which has an absolute effect on profitability.

The cause of corporate failure occurs in a wide and complex process and therefore cannot be pointed out with a single factor. But when viewing from actual case examples, it can be largely categorized as insufficient capital type, collapse due to over expansion type, undisciplined management type, chain reaction bankruptcy type, and failure research and development type. Such corporate failure prediction system identifies the factors which can distinguish the failure and normal businesses from the management environment and the positive and negative characteristics. Depending on the application method during the evaluation process, it is divided into a check list model, multiple discriminant model, logit model, statistics model, artificial nervous system model, and outlier model. And depending on the index value used in the prediction, the categories are divided into a univariate model, accounting model per prediction data, market value model, and qualitative model.[19)]

The multiple discriminant analysis is measured in the actual practice in the financial environment and is the most widely used method. It points out the factors which best differentiate the failing companies from normal companies through statistical analysis of various measured factors pertaining to company's failure. It then considers the importance of such factors and combines the factors. The independent variables inputted upon setting up the multiple discriminant analysis model are the measured data such as the target company's financial statement. The result of the discriminant analysis (dependant variables) shows which of the failure or normal group the target company falls into. On the positive side, this model allows easy discrimination of the target company when inputting the true data by extracting the discrimination factors

19) Financial Institution Training Manual (2007), Was comprehensively created with reference to the actual practices in financial institutions. (page 21)

which deducts the weighted average per individual index based on the mutual degree of importance of failure prediction indexes and forms a functional formula.

Altman' Bankruptcy Discrimination Formula (non-listed company model): $Z = 0.171X_1 + 0.847X_2 + 3.107_3 + 0.420X_4 + 0.998X_5$

X_1: (liquidable asset - liquidable liability)/total assets

X_2: retained earnings/total assets

X_3: operation income (EBIT)/total assets

X_4: capital/total liabilities

X_5: revenue/total assets

Determining basis: If $Z < 1.81$ then failure (high likelihood of failure); if $1.81 < Z < 2.99$ then suspend evaluation (requires precise analysis); if $Z > 2.99$ then healthy (no likelihood of failure)

The logit model is similar to the multiple discriminant analysis but as the standard basis, it does not hypothesis the distribution of various measured index as the standard distribution. Therefore, it is very flexible in hypothesizing the distribution. So if basic conditions are satisfied, it can be applied to any distribution type. Since the model presents the failure rate per individual company as the result, it can be applied to determine the degree of failure. On the negative side, it uses similar methodology as the multiple discriminant analysis so limitation on accuracy exists. However, since the target can be categorized and grouped per business type and size, models can be formed and applied to number of groups and is therefore the most widely used analysis method in financial sector.

Logit Model: $\beta = a + bX_1 + cX_2 + ... + zX_n$

Failure Likelihood Value: $Pr = 1/(1 + \exp \beta)$

β: Logit Functional Value (dependant variable)

a .... z: Coefficient Value for Combining Financial Ratio (weighted)

X: Failure Prediction Variable (financial ratio, independent variable)

These models each have their own pros and cons. The models most widely used by banks are the multiple discriminant analysis and the logit model. Together with such measuring method, it is important to consider diverse information acquired from bank tellers and stock market as well as the relationship manager’s (RM) decision.

Although there is a degree of difference among the models and specific details of analysis used by the leading banks, the common ground is that the basic consideration is made on the comprehensively on financial and non-financial factors. Such system considers various factors which are important for credit risk evaluation and by calculating such factors and reflecting on decision process, it can reduce, if not eliminate non-objective factors of the underwriter and focus on the objective decision process. In addition, by applying the models on the initial phase of the credit loan's decision process, it allows efficient loan approval process by instantly approving the qualified company and separating other companies requiring direct analysis.

Therefore, there seem to be no significant difficulties for Chinese financial institutions in utilizing advanced scoring models and using multiple discriminant analysis and logit model, which are widely used in advanced countries, for company failure prediction model. In fact, many Korean banks use multiple discriminant analysis and logit model for loan review, internal regulation, and setting investment standards. Strengthened with continuous corporate restructuring and upgrade in risk management, the ratio of non-performing loan (NPL), which significantly increased after the foreign currency crisis is brought down to below the 2% level since the end of 2006.[20)]

Until now, this report reviewed the credit risk management system implemented by the leading financial institutions to identify appropriate measurements applicable in China’s financial institutions. Next, development tasks applicable to China’s financial institutions with such system will be closely reviewed.

20) According to the data from “Non-Performing Loan Settlement Fund's 10 Year Performance & Future Projects,” presented in the International Forum held by Korea Asset Management Corporation (KAMCO) (April 3, 2007), the NPL in Korea was reduced from 7% in 1997 to 1.9% by the end of 2006. (page 24)

Ⅴ. Development Tasks for Corporate Credit Evaluation System of Chinese Financial Institutions

In any country, it is a known fact that finance is used as a means for economic development. However, it must grow in balance with actual economy so together with the economic growth, policy, management method and management system must continuously improve as well. It is especially important to enhance asset management of four major state-owned independent banks, which, together, occupies majority market share in Chinese banking industry.

When viewing Chinese corporations' 2007 capital acquisition pattern, bank financing occupied 78.9% and among such amount, the state owned commercial banks provided 54.3% of the assets. The NPL ratio of Chinese banks as of the end of 2005 was at about 8% level.[21] Although such high rate of NPL has been largely reduced through vast efforts including policy improvement and corporate output enhancement, such improvement also includes just numeric reduction due to large increase of new loan since 2002.

As previously mentioned, the majority of responsibility of NPL in four major state-owned banks lies more on the government's excessive interference with banking business, insufficient legal regulations, and inappropriate customer management centered around the state owned corporations, than the banks themselves. In addition, although policy improvement has been continuously pursued through emphasis in competition and switching organization structure to stock issuing incorporation, the banking service is still dependent on margins on savings and loan with simple loan income structure and therefore, there is a necessity for income management through continuous advancement of credit risk management for credit loans. Especially since

21) At the aforementioned forum, Jim Mcknight of UBS stated that he estimates the Chinese NPL rate has also significantly improved from 25~40% in the past to 7.1~8.6% level in 2005. (page 25)

2002, with the usage of foreign short term hot money, which provided abundant liquidity, the increased new loans including mortgage loan or automobile financing may have reduced the non-performing debt ratio in numeric value but it may have spun a new load of potential default debt in the long run.

With the joining of the WTO in 2001 and full opening of the financial market in 2007, the Chinese financial institutions are directly facing global competition. When considering the financial pressure Korea has experienced during the economical development process in the ’70s through ’80s, the current period is deemed to be the most optimum time for modernizing the risk management system for the advancement of Chinese financial industry and utilization of advanced examples such as from Korea is viewed to be highly effective.

Prior to 1995, Korean banks utilized Comprehensive Corporate Evaluation Index set forth by the Central bank and commencing on July 1995, after the abolition of obligated Comprehensive Corporate Evaluation Index up until just before the foreign currency crisis, the Medium and Small Size Business Credit Evaluation Index developed by the Central bank and Korea Federation of Banks was utilized.[22] However, if all financial institutions utilize the same standardized credit scoring model such as Comprehensive Corporate Evaluation Index or the Medium and Small Size Business Credit Evaluation Index, they will not be able to correctly reflect the client's unique characteristics or the differentiated strategy. Therefore, after the foreign currency crisis, each bank utilized its own customized corporate credit evaluation system. In addition, since the implementation of ‘New BIS Agreement’ in 2007, each bank has developed and is utilizing more advanced credit evaluation system.

Such selection of successive corporate failure prediction models and development of credit evaluation system each have their own pros and cons so each individual financial institutions must consider various factors including evaluation goal and management policies and apply as a part of comprehensive evaluation system. During

22) Financial Statement Analysis & Corporate Valuation (Kim, Kwan-Joong and Kim, Moon-Cheul, 2007), pages 477-478. (page 26)

the credit loan review and for the post loan management, the signs of failure and its cause must be carefully considered and measurements must be made. In addition, since customer's data base must be established and acquired data must be reliable, verification must be made that the publicized information have been standardized and that transparency has been acquired. As for the results, it is important to always verify at actual business site, utilize human experience and insight, and compare with external organization's evaluation.

It may be good practice for Chinese financial institutions to utilize general risk management system shown in [figure 5], which is used by leading financial institutions.

Recently, with the advancement of computer and the Internet, a comprehensive analysis which includes unique characteristics, environment, qualitative factors based on the quantitative financial statement analysis using the system has become the

Figure 5. Example of Risk Management System[23)]

23) Korea Development Bank (2007), *Risk Management*, page 9. (figure 5)

general practice. However, analysis must not be depended only on complex formula and measurements for risk evaluation of complex financial derivatives. Especially, as experienced in 2007 subprime mortgage crisis, being dependent on scientific risk management system on managing diverse financial derivatives developed with credit as the parameter for simplified increase in profitability and acquiring capital based on basic financial assets may result in new risk accumulation crisis that will cause chain reaction affecting the entire global financial system.

In the end, the risk management efforts exposed in the growth process of Chinese financial market show that the formation of risk management system has been constrained primarily by the socialist system in which assets were planned distributed and the government intervened.

As a result, China, since the full opening of its financial market in 2007, is now at a point where it must pursue improving the socialist oriented market competition structure by strengthening infrastructure, core industry, and regional development functions through policy oriented banks and at the same time, with the basis of modernized banking system of state owned commercial banks, establish healthy internal regulation and policies, and enhance competitiveness by raising the quality of the loan and improving the service.

As part of such advancement project, first, it needs to become more transparent and objective in credit loan and customer management since the Central government or the regional government is the banks' major share holder even though the nation's economy is based on sharing and there is management freedom. However, excessive empowerment of authority may cause corruption and over supervision may interfere with the business operation so balanced adjustment is necessary.

Second, it is imperative to establish and improve the Check & Balance banking environment for qualitative improvement in quantitative growth oriented practice spread throughout all industries in China. Appropriate combination between RM, who aggressively seeks out business opportunities and CO, who conservatively reviews business opportunities to minimize risk, is required. In other words, the bank's core business is transforming from simple capital mediating function to generating income through strategic risk management and accordingly, there is a need for paradigm shift from management, which was oriented on quantitative expansion based on savings and loan margin to the qualitative management which appropriately manages both the risk and income. Especially, in order for risk management to be properly settled, corporate culture that accepts such change needs to be in place and to achieve this, clear understanding of risk management by the top management is highly important.

Third, although forming partnership with foreign banks with professional experience and knowledge is necessary, it is more important to improve the banks' governance structure, supervision of regional branches, and establishment of rational organization for reducing the information asymmetry. Distorting information to individually react to government regulation, bank, share holders, and employees may result in deteriorating brand value and credibility which will result in deterioration of competitiveness.

Fourth, acquisition of accounting and financial data, which are the basic information for all evaluations, must be simplified, customer data base, which is the basic requirement for long term planning, customer management, and measurement analysis must be established, and reliability must be secured on acquired information.

Fifth, information sharing should not be limited to just sharing of credit information among banks but must expand to diverse financial institutions with abundant information and appropriate to the global standards to improve efficiency of credit loan review process and to acquire favorable proposal by vitalizing Chinese research.

Sixth, to expand in the areas of retail finance, transaction fee revenue, credit card business private banking, and other new businesses from major corporation oriented loan business, relative business system must be developed as well as professional personnel fostered. In addition, incentive policy appropriate to the performance must be strengthened. Especially, risk management needs to be included in various college curriculum and the financial institutions need to expand to overseas market and develop international businesses and acquire financial know-how through competition in advanced markets and apply such knowledge in both domestic and overseas financial industries.

Seventh, management efficiency must be achieved by inviting capability oriented professionals to the executive positions of state-owned banks rather than through political appointment.

VI. Conclusion

Thus far, the management status and issues related with corporate credit risk of financial institutions in China's financial market in its growth process were reviewed. In addition, advanced credit risk evaluation systems were reviewed and by studying ways to apply such system in Chinese financial institutions, means to advance their corporate credit evaluation policies for efficient credit loan review and improvement in asset stability were presented. The summary of the research results are as follows.

Although the Chinese stock market has seen relatively rapid growth since the reform and opening of the financial market, the banking system, or the indirect financial market, still holds an important position with over a 78% market share out of the entire financial market. Even now, the Chinese banking business is highly dependent on margins on savings and loan with simple loan income structure. Therefore, an increase in income through continuous advancement of credit risk management for credit loan is vital. Especially with significant increase of new loans after 2002, which signifies large increase in risk, when conducting loan review, precise credit evaluation must be conducted. Also, other appropriate risk management must be made for short and long term fund acquisition, and mismatch operation must be managed.

As a result, China, for the time being, must reshuffle policy oriented banks to focus on the improvement in infrastructure, core business, and assisting in regional development. Based on the modern banking system of state owned commercial banks, it must establish healthy internal organization, reduce financial risk by raising the quality of loan, and enhance competitiveness by improving service. The financial institutions must continuously pursue market reform and urgently needs the modernization of customer credit evaluation and performance measurement system for more quicker and objective evaluation.

When viewing the credit analysis conducted by financial institutions, it can be said that the objective of the analysis is to identify the credit capability of the target company as a sustainable corporation. The ultimate interests of such credit analyses are financial information, or especially the corporation's performance analysis through financial statement. For this, the company is evaluated based on the environment and business analysis on its corporate strategy in the categories of company, business, management area and overall decision on the company's stability, profitability, production ability, efficiency, and growth ability needs to be made by connecting this with the variables of financial statement. In such process, the corporate failure prediction and management is the core of the credit analysis and it can therefore, become an essential analysis tool for comprehensive credit evaluation system.

Upon entering the WTO in 2001 and fully opening the financial market in 2007, the Chinese financial institutions are directly facing global competition. When considering the financial pressure Korea has experienced during the economical development process in the '70s through '80s, the current period is deemed to be the most optimum time for modernizing the risk management system for the advancement of the Chinese financial industry and utilization of advanced examples such as from Korea is viewed to be highly effective.

The customer credit evaluation system, which is becoming the core of credit loan review and post loan management process, must be established as the comprehensive evaluation system that includes the failure prediction with consideration of each financial institution' evaluation objective, usage rate, and current management policy. Especially for the failure prediction, multiple discriminant analysis and the logit model should be used and when using such models, it is appropriate to use failure sign identifying method as per check list.

Such selection of successive failure prediction model and system development requires establishment of data base and it is also important to acquire reliability of gathered data. As a result, the standardization and efforts in transparency must continuously be made and improved. As for the analysis result, it is important to always verify at the business site and to refer to external institutions' evaluation.

On the other hand, the past risk structure of financial institutions, especially the banks, showed that over 70% of the assets were linked with customers' credit risk, other risk associated with market fluctuation, and organization's operation risk. However, even though there are difference per business type, financial institutions' risk is also increasing as the financial environment become globalized, increase in electronic trade, large scale M&A, automation, expansion, increase in outsourcing, complexity of product, and increase of law suit. As a result, Asset Liabilities Management (ALM), which objective is to maximize income while considering risk through organizing the formation of assets and liabilities of financial institutions. In addition, development of corporate wide risk management system as per Bank for International Settlements (BIS) Rule, which was started from the minimum capital adequacy ratio regulation for healthy financial structure of banks and for financial order in the market.

As evidenced by the subprime mortgage crisis in America in 2007, in current generation, risk has also become globalized. In order to instantly react to unstable factors of international financial market, it is important to build mutually existing relationship with financial institutions of other nations and acquiring supervisory structure is essential. In addition, strengthening intra-cooperation is important so that the growth of Chinese financial industry will also contribute to the mutual growth of Asia and also provide assistance for risk management.

In conclusion, the risk management efforts exposed in the growth process of the Chinese financial market show that the formation of risk management system has been constrained primarily by the socialist system in which assets were planned distributed and the government intervened. Although China's economy is based on sharing and has management freedom, it needs to establish global standard business environment in accordance with the opening of the financial market since the Central government or the regional government is the banks' major share holder. Risk management is the process of recognizing, measuring, controlling, and reporting risk. Therefore, it is necessary to modernize the management system while gradually improving the financial governance structure, continuously improving the information asymmetry, supervision, rationalization of control system, and acquiring transparency and objectivity on declared information. Most importantly, performance-based human resources management must be conducted to foster professionals, train risk management personnel, and implement adequate incentive system.

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중국의 금융 시장 발전과 은행의 위험 관리

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본 연구의 목적은 중국 금융 시장과 현재의 위험관리 상황을 살펴보고, 진보된 기업 신용 위험 평가 체계를 도입할 때의 잠재력을 검토함으로써 국가의 신용 점수와 자산 관리 기강을 강화하려는 다양한 금융 기관의 노력을 도우려는데 있다.

중국 금융 시장의 78% 이상을 차지하고 있는 중국의 은행은 여전히 예금과 대출의 차액에 의존하는 구조이다. 그러므로 전반적인 신용 위험 관리 운영이 개선될 필요가 있다. 신용 평가와 차후 관리에 중요한 역할을 하는 기업 실패 예측을 포함한 중국의 신용 평가 체계는 개개의 기관의 평가 목적과 사용 및 현 경영 체계를 고려한 포괄적인 평가 체계의 일부로 설계되어야 한다.

중국의 금융 산업을 육성하고 강화시키려면 중국은 양적 확장에서 질적 진보로 바뀌는 현대 금융 체계를 구현하는데 초점을 맞추어야 한다. 중국에 특화된 기업 신용 평가 체계의 설립과 근대화를 위해 금융 체계와 금융 현실이 글로벌 표준을 만족해야 한다는 것 역시 시급한 과제이다.

주제어: 중국 금융 시장, 은행의 위험관리, 기업 신용 평가, 중국 기업 실패 평가 체계

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