BASEL II IMPLEMENTATION IN THE CHINESE BANKING SYSTEM

By

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Abstract

This report reviews the implementation of Basel II, an international standard for banking regulations, in the Chinese banking system. In this report, I review the Basel Accords, including Basel I and Basel II, as well as conduct a detailed comparison and analysis of policy changes and their implications on international banking. Then, I summarize the evolution of the Chinese banking system with respect to its capital and the features of current Chinese banking system. Overall, the findings of the study show that the four important features of Chinese banks, namely, size and quality of assets, capital adequacy ratio, and profitability, have made great progress under Basel II standard compliance, particularly for state-owned commercial banks.

Based on this analysis, I provide several recommendations. These recommendations focus mainly on the IRB Approach implementation for the Chinese banking system and a supervisory framework for the Chinese banking regulator.

Keywords: Basel II; Chinese banking system; capital adequacy; three Pillars; the IRB Approach.

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Glossary

"**A** special purpose vehicle"	A legal entity (usually a limited company of some type or, sometimes, a limited partnership) created to fulfil narrow, specific or temporary objectives. (abbreviation: SPV) SPVs are typically used by companies to isolate the firm from financial risk. A company will transfer assets to the SPV for management or use the SPV to finance a large project thereby achieving a narrow set of goals without putting the entire firm at risk.
Basel Committee on Banking Supervision	A committee of banking supervisory authorities that was established by the central bank governors of the Group of Ten countries in 1975. It consists of senior representatives of bank supervisory authorities and central banks from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom, and the United States. (abbreviation: BCBS)
Basel I	The round of deliberations by central bankers from around the world. In 1988, the Basel Committee in Basel, Switzerland, published a set of minimal capital requirements for banks. This is also known as the 1988 Basel Accord.

Basel II	The second revision of the Basel Accords, which are recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision. This is also called International Convergence of Capital Measurement and Capital Standards (A Revised Framework).
Bank for International Settlements	An international organization fosters international monetary and financial cooperation and serves as a bank for central banks. As its customers are central banks and international organizations, the BIS does not accept deposits from, or provide financial services to, private individuals or corporate entities. The BIS strongly advises caution against fraudulent schemes. (abbreviation: BIS)
Capital account liberalization	Free capital movements. It helps channel resources into their most productive uses, and thereby increases economic growth and welfare-nationally and internationally.
Capital ratio	The percentage of a bank's capital to its risk weighted assets.
China Banking Regulatory Commission	An agency of China authorized by the State Council to regulate the Chinese banking sector. (abbreviation: CBRC)

Fitch Ratings, Ltd.	An international credit rating agency was dual-headquartered in New York City and London. It was one of the three Nationally Recognized Statistical Rating Organizations (NRSRO) designated by the U.S. Securities and Exchange Commission in 1975, together with Moody's and Standard & Poor's.
International Monetary Fund	An international organization that oversees the global financial system by observing exchange rates and balance of payments, as well as offering financial and technical assistance when requested. (abbreviation: IMF)
Market economy	Also called a free market economy, free enterprise economy, is an economic system in which the production and distribution of goods and services takes place through the mechanism of free markets guided by a free price system rather than by the state in a planned economy.
Moody's Corp.	The holding company is for Moody's Investors Service, which performs financial research and analysis on commercial and government entities. The company also ranks the credit-worthiness of borrowers using a standardized ratings scale.
Non-cumulative Preferred Stock	One type of preferred stock, of which dividend will not accumulate if it is unpaid. Under BIS rules, preferred stock must be non-cumulative if it is to be included in Tier 1 capital.

OECD	A group has 30 member countries sharing a commitment to democratic government and the market economy.
Planned economy	A centrally planned economy (or command economy), in which the state or government controls the factors of production and makes all decisions about their use and about the distribution of income.
Perpetual Preferred Stock	One type of preferred stock that has no fixed date on which invested capital will be returned to the shareholder, although there will always be redemption privileges held by the corporation. Most preferred stock is issued without a set redemption date.
Risk-weighted assets	Banks will allocate risk weights for each asset based on its risk level.
Securitization	A bank sells its assets (e.g. loan) to a SPV, which finances this purchase through issuance of asset-backed securities (ABSs) to private investors. For bankruptcy, accounting and regulatory purposes, SPVs generally are treated as legally separate from the sponsoring bank; therefore, they are not consolidated into the sponsoring bank's financial statements and regulatory reports. In many cases, a bank can treat securitized assets as true sales. The bank adds cash from this sale and removes the loan item from balance sheet, for accounting and regulatory purposes, even though the bank retains most of the underlying risks through credit enhancements it provides to the ABSs. From this, the bank can

	increase its capital ratio.
Standard & Poor's Corp.	A financial services company. Its products and services include credit ratings, equity research, S & P indices, funds, risk solutions, governance services, evaluations, and data services.
Trading book	A trading book that consists of positions in financial instruments and commodities held either with trading intent or in order to hedge other elements of the trading book. To be eligible for trading book capital treatment, financial instruments must be either free of any restrictive covenants on their tradability or able to be hedged completely.
World Bank Group	A group of five international organizations responsible for providing finance and advice to countries for the purposes of economic development and eliminating poverty.

1 Introduction

The purpose of this report is to conduct a review on the implementation of Basel II, an international standard for banking regulations, in the Chinese banking system. Basel II is the second revision of the Basel Accords, which consists of recommendations of banking laws and regulations, issued by the Basel Committee on Banking Supervision in 2004. Specifically, the regulatory framework of Basel II is divided into Three Pillars: minimum capital requirements, supervisory review process, and market discipline. To date, the degree to which the Chinese banking system has complied with Basel II has had significant benefits for the competitive advantage of Chinese banks in terms of following the progress and development of financial industry; maintaining the consistency of a market economic policy; reducing the gap of experience and technology; getting the support from IMF and World Bank; lowering the costs of raising money; and obtaining the opportunity for expanding businesses. Therefore, the objectives of this study are to identify the remaining challenges and problems faced by the Chinese banks and to provide recommendations regarding a more stable and faster process to prepare for complete implementation of Basel II.

In this report, I will review the Basel Accords involving Basel I and Basel II as well as the Basel Committee. Based on Basel II's four main improvements upon Basel I, I will conduct a detailed comparison and analysis of policy changes and their implications on international banking. Then, I will summarize the evolution of the Chinese banking system with respect to capital and the features of current Chinese

banking system, which also includes a review of the Chinese banks' internal rating system. Finally, recommendations will be presented with an emphasis on the Internal Rating-Based Approach (IRB Approach).

Overall, the findings of the study show that the three important features of Chinese banks, namely, size and quality of assets, capital adequacy ratio, and profitability, have made great progress under Basel II standard compliance, particularly for state-owned commercial banks. State-owned commercial banks not only dominate the Chinese banking industry in terms of size of assets, but also rank ahead of other Chinese banks in capital adequacy ratio, quality of assets and profitability. Realizing the rationale of implementing Basel II, the Chinese banking regulator and many banks have made significant efforts in preparation for a complete adoption of Basel II. As a new banking supervisory committee formed in 2003, the China Banking Regulatory Committee (CBRC) has seized the opportunity for Basel II implementation to further reform the Chinese banking industry. By the first quarter of 2009, CBRC had established a high-level steering committee in the banking industry to promote Basel II implementation, released the first set of rules to all the banks, and finished the public consultation on the eight documents under the Basel II regulatory framework. Most importantly, the majority of Chinese banks have begun to abide actively by those policy guidelines and documents.

However, a major gap still exists between the current status of the Chinese banking industry and the implementation requirements set by Basel II. As discussed in Chapter 4, the biggest challenges of complying with the Three Pillars of Basel II that have resulted in CBRC's duties being difficult to perform include the difficulties of adopting and implementing the IRB Approach, and the lack of inter-industry support.

Finally, it is hard for the Chinese banking industry to find a mechanism that facilitates a bank's risk management ability to complete the bank's obligation of fully implementing Basel II.

To address the abovementioned challenges and problems, I have put forth several recommendations focusing on the IRB Approach and the supervisory framework, as outlined in Chapter 5 of the report. In order to fully adopt the IRB Approach, joint efforts should be made by all stakeholders within the Chinese banking industry. On one hand, individual banks need to improve their internal conditions, like designing a rating model and building a comprehensive and timely database. On the other hand, CBRC needs to increase efforts to establish the social credit rating system by combining with other functional departments. They also need to seek frequently more feedback from all the Chinese banks, and create an orderly financial environment that is fit for implementing Basel II. In terms of a supervisory review process, I introduce and adapt the Supervisory Framework revised by the Office of the Superintendent of Financial Institutions, a primary regulator of the Canadian banking industry. Owing to the smooth operation of the Supervisory Framework under Basel II requirements since 2002, the framework can be readily adapted and applied to the Chinese banking industry.

The adoption and implementation process of Basel II can be long and complex, especially for banks in developing countries. Nevertheless, the benefits of implementing Basel II in the long run will outweigh all the costs and efforts. The consequence of full Basel II standard compliance will undoubtedly turn the Chinese banking regulator, as well as the banks, into influential actors in international banking.

2 Background of the Basel Accords

In this chapter, I will briefly introduce the Basel Committee on Banking Supervision (BCBS) and Basel Accords (Basel I and Basel II), as well as analyze and summarize the differences between Basel I and Basel II.

2.1 The Basel Committee

BCBS (refer to Appendix A) is a standard setting body of banking supervisory authorities that was established by the central bank governors of the Group of Ten (G10) countries in 1974. BCBS's members come from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, United Kingdom and United States. Countries are represented by their central banks and also by the authorities with formal responsibility for the prudential supervision of banking business. However, BCBS is not a supervisory organization of international banks with legal force**.**

BCBS's main contribution is the publication and continuous improvement of Basel I (1988 Basel Accord), which was issued in 1988. BCBS has also successfully enabled legal enforcement of the Accord in the G10 countries, while ensuring that the Accord is both well recognized and implemented by many non-G10 countries as a standard of effective banking supervision. In June 2004, a revised Basel Accord (Basel II) was issued called, "International Convergence of Capital Measurement and Capital

Standards, a Revised Framework." In June 2006, a comprehensive version of Basel II was issued (Refer to Appendix B).

2.2 The Basel Accords

2.2.1 Basel I

In the mid-1980s, the effects of financial market liberalization, globalization and deregulation enhanced concerns about the long-term health of the banking system in many countries. The first concern was the effect of competition on bank profitability and capital building. The second reflected the changing nature of risks taken by banks. The final concern was the influence of regulatory capital requirements on the risk-taking decisions of banks.

BCBS intended to set a standard that would help the active international banks effectively supervise their banking activities by requiring them to maintain a certain capital level. The most important innovation they came up with was the risk-based structure, which assigned different capital weights to a number of assets, both on- and off-balance sheets. This was intended to prevent banks from taking risk. However, the risk-based structure would inevitably introduce a new set of distortions to the decision-making of banks because of its simple nature. Additionally, the fast growing innovations of new financial techniques by the international banking industry would bring new, unavoidable issues.

In 1988, BCBS proposed a set of minimal capital requirements for banks, known as Basel I or the 1988 Basel Accord (refer to Appendix C). BCBS hoped to continuously review and improve the Accord based on its effects, as well from feedback regarding

issues such as raising capital ratios, promoting financial stability and taking off-balance sheet exposures into account in assessing capital adequacy.

Basel I focused on credit risk, the risk of loss due to a debtor's non-payment of a loan or other line of credit (either the principal or interest/coupon or both). It mainly addressed banking in the sense of deposit taking and lending. It required banks, especially those with an international presence, to hold capital equal to 8% of their risk-weighted assets. The central part of this Accord consisted of capital and credit risk, with a requirement of:

$$\frac{\text{capital}}{\text{credit risk}} \geq 8\%$$

According to Basel I's definition, a bank's capital is comprised of two tiers. Tier 1 ("core") capital includes the book value of common stock, non-cumulative perpetual preferred stock and post-tax retained earnings. Tier 2 ("supplementary") capital was recognized as lower quality. It included, based on various conditions, general loan loss reserves, long-term subordinated debt and cumulative and/or redeemable preferred stock. At most, Tier 2 capital could only compose 50% of a bank's capital.

Since 1988, this framework has been progressively introduced and enforced by law in G10 member countries. Most other countries, currently numbering over 100, have also adopted and utilized the prescribed principles under Basel I (Amswers.com, 2009). China also released "Regulation for Commercial Bank Capital Adequacy" in early 2004, which is based on Basel I.

2.2.2 Basel II

BCBS has consulted with bank supervisors[1] worldwide to improve Basel I based on its issues and weaknesses. This has led to a new standard, Basel II, or the New Basel Accord, introduced in June 2004. The purpose of Basel II is to improve the consistency of capital regulations and promote enhanced risk-management practices among large, internationally active banks.

A. Improvement

Several milestones between 1988 and 2004 have marked the continuing efforts of BCBS to enhance the regulatory policies and guidelines. In 1988, BCBS decided to introduce a capital measurement system called as the Basel Capital Accord (Basel I), which requires the implementation of a credit risk measurement framework with a minimum capital standard of 8% by the end of 1992. In 1996, the market risk related to book trading was added to the capital requirement. In June 1999, BCBS issued a proposal for a revised Capital Adequacy Framework, which became the original draft of Basel II. BCBS presented a more concrete proposal on May 31, 2001, that reflected the comments of ongoing dialogue with the industry and supervisors from interested parties worldwide. Following extensive interaction with banks, industry groups and supervisory authorities which were not members of BCBS, the revised framework (Basel II) was finally issued on 26 June 2004 (BCBS, 2009d).

[1] A Banking **Supervisor** usually means the Central Bank of one country.

Table 2.1: **The Evolution of the Basel Accords**

Time	**Actions**
July 1988	Basel I issued
December 1992	Deadline for implementation
January 1996	Incorporate market risk to the capital accord
June 1999	First Consultative Package on Basel II
January 2001	Second Consultative Paper
April 2003	Third Consultative Paper
June 2004	Basel II issued (updated to November 2005)
June 2006	A Comprehensive Version of Basel II issued
December 2006	Effective date of BASEL II

Refer to Appendix B: Timeline of the Basel Accords Issued by BCBS

B. Main Structure of Basel II (refer to Appendix D)

There are three mutually reinforcing pillars in Basel II, which work together to help the financial system achieve safety and soundness (refer to Appendix E, G and H).

The First Pillar: Minimum Capital Requirements

This pillar sets out the minimum capital requirements that institutions will be required to meet to cover credit risk, market risk and operational risk.

The Second Pillar: Supervisory Review Process

This pillar creates a new supervisory review process, which requires financial institutions to have their own internal systems to assess their capital needs. It also requires supervisors to evaluate an institution's overall risk profile to ensure that adequate capital is held.

The Third Pillar: Market Discipline

This pillar is designed to improve transparency by requiring financial institutions to publish certain details of their risks, capital and risk management (Out-law.com, 2008).

2.2.3 Comparison

A. The Biggest Change: the IRB Approach

The IRB Approach is one of the core contents of Pillar 1, and is one of the main innovations and most influential changes in Basel II.

This approach is based on four quantitative inputs (refer to Appendix E):

- Probability of default (PD), which measures the likelihood that the borrower will default over a given time horizon;
- Loss given default (LGD), which measures the proportion of the loan that will be lost if a default occurs;
- Exposure at default (EAD), which for loan commitments measures the amount of the facility that is likely to be drawn if a default occurs;
- Maturity (M), which measures the remaining economic maturity of the loan.

In addition to this, the IRB Approach has two editions: the foundation edition and the advanced edition, which are differentiated by these inputs. The different data inputs are summarized in Table 2.2, below:

Table 2.2: **Input differences of foundation and advanced IRB Approaches**

Data Input	**Foundation IRB A**	**Advanced IRB A**
Probability of default (PD)	Provided by bank based on own estimates	Provided by bank based on own estimates
Loss given default (LGD)	Provided by regulatory authority	Provided by bank based on own estimates
Exposure at default (EAD)	Provided by regulatory authority	Provided by bank based on own estimates
Maturity (M)	Provided by regulatory authority	Provided by bank based on own estimates

Refer to Appendix E: Detailed Explanation of Basel II

B. Other Main Differences

Basel I is focused on a single risk, i.e. credit risk, while Basel II highlights mixed risk. It is comprised of credit risk, market risk and operational risk. Therefore, in terms of calculating the capital requirement, although the minimum requirement is the same at 8%, there is a capital / credit risk >= 8% in Basel I while there is capital / (credit risk + market risk + operational risk) >= 8% in Basel II. As a result, adopting Basel II is more conservative when calculating the capital adequacy ratio.

Secondly, Basel II offers a variety of techniques in calculating capital adequacy rate. In Basel I, the only approach is to calculate the sum of risk-weighted asset values. However, Basel II provides more complex methods of risk calculation, including three choices for credit risk calculation: The Standardized Approach, Foundation Internal Rating-Based Approach, and Advanced IRB Approach; two methods for market risk calculation: The Standardized Approach and The Internal Models Approach; and finally three techniques for calculating operational risk, The Basic Indicator Approach, Standardized Approach and Internal Measurement Approach. Appendix F contains

detailed information about these measurement techniques. Therefore, Basel II has more flexibility and benefits in risk management.

Third, the approach in Basel II has higher risk sensitivity. Although the standardized approach is the same in both Basel I and Basel II, Basel II allocates a risk-weight to every asset and off-balance-sheet positions, while Basel I appoints one risk weight based on the broad category of borrower (i.e. banks or corporate). Therefore, Basel II analysis is more risk sensitive and is better for revealing the risks. Two common examples are presented in Appendices G and H.

Finally, Basel II offers safer and broader coverage of banking regulation. Whereas Basel I concentrated on supervision, Basel II covers several integrated aspects including a bank's internal methodologies, supervisory review, and market discipline. Clearly, Basel II has broader scope with respect to regulation. Thus, the result of implementing Basel II should make a banking system safer, sounder, and more efficient.

The comparison of Basel I and II is summarized in Table 2.3.

Table 2.3: **Comparison of Basel I and Basel II**

Basel I (Weaknesses)	**Basel II (Improvement upon Basel I)**
Focus on a single risk, credit risk	Broader contents include credit risk, market risk and operational risk
One size fits all in calculating capital adequacy rate	Menu of approaches and incentives for better risk management
Broad-brush structure on risk measurement	More risk sensitivity measurements
Mainly depend on supervision of capital adequacy rate	More emphasis on banks' own internal methodologies, supervisory review, and market discipline

Refer to Appendix E: Detailed Explanation of Basel II

In conclusion, through the introduction and the analysis of the Basel Accords, it has been shown that Basel II has made great progress in risk scale calculation and regulation scope in comparison with Basel I. Basel II has developed a complicated methodology that needs lots of professional training and expertise to implement. However, Basel II is widely recognized and treated as an emerging trend of risk management in the banking industry.

3 Review of the Chinese Banking Industry

Over the last few decades, People's Bank of China (PBC) exercised the functions and powers of a central bank, in addition to handling both industrial and commercial credit and savings businesses. It was neither the central Chinese bank in the true sense, nor was it a commercial entity which conformed to the laws of the market economy. Since the start of the opening-up reform in 1979 however, China has carried out a series of significant reforms in its banking system, and strengthened its degree of openness to the outside world. Consequently, the finance industry has made steady developments since the reform began.

In 1984, PBC stopped handling credit and savings businesses and began to formally exercise central bank functions and powers. This was done by conducting macro-control and supervision over the nation's banking system. The Industrial and Commercial Bank of China (ICBC) was the major supplier of funds to China's urban areas and manufacturing sector (Wikipedia, 2009a). The Bank of China (BOC) specialized in foreign-exchange transactions and trade finance (Wikipedia, 2009a). The Agricultural Bank of China (ABC) specialized in providing financing to China's agricultural sector and offered wholesale and retail banking services to farmers, township and village enterprises and other rural institutions (Wikipedia, 2009a). The China Construction Bank (CCB) specialized in medium to long-term credit for long term specialized projects, such as infrastructure projects and urban housing development (Wikipedia, 2009a). The four of them were called the "Big Four" banks in China. In 1994,

the Big Four were converted into wholly state-owned commercial banks (SOCBs) and three policy banks[2] were founded. The Agricultural Development Bank of China (ADBC) provides funds for agricultural development projects in rural areas. The China Development Bank (CDB) specializes in infrastructure financing. The China Import and Export Bank (Chexim) specializes in trade financing (Wikipedia, 2009a). In 1995, the Commercial Bank Law was promulgated. This set the stage for forming the commercial bank system and organizational structure, and provided a legal means for changing specialized state banks to SOCBs. Since the enactment of this statute, the organizational structure of the financial system has gradually improved. The state-owned commercial banks have been transformed into modern financial enterprises, handling currencies by capital injection. Over 120 shareholding medium- and small-sized commercial banks have been set up or reorganized, and both securities and insurance financial institutions have been further standardized and developed. In April 2003, the China Banking Regulatory Commission (CBRC) was formally established. Since then, a financial regulatory system has been created in which the CBRC, the China Securities Regulatory Commission (CSRC) and the China Insurance Regulatory Commission (CIRC) work in coordination, with each body having its own clearly defined responsibilities.

In January 2004, soon after the second capital injection (see section 3.1 C below), the State Council decided that BOC and CCB would begin transforming the shareholding system[3]. The main tasks were to: 1) establish standardized corporate governance and internal system of rights and responsibilities in accordance with the requirements for

[2] **Policy banks** are banks which are responsible for financing economic and trade development and state-invested projects.

[3] The first capital injection happened in 1998.

modern commercial banks; 2) restructure the financial system to speed up the disposal of non-performing assets; and 3) reinforce the minimum capital requirement to build first-class modern financial enterprises. At the present time, three of the Big Four banks, ABC being the exception, have fulfilled their reconstructions and completed listings. Since 2007, the Bank of Communications (BOCOM) has joined the ranks of state-owned commercial banks. Thus, there are currently 5 SOCBs and 12 joint-stock commercial banks[4] (JSCBs). They dominate the Chinese banking industry and are referred to as major Chinese commercial banks. Besides these major commercial banks, there are other medium- and small-sized financial institutions including city commercial banks (CCBs), rural commercial banks (RCBs), urban credit cooperatives (UCCs), rural credit cooperatives (RCCs), postal savings, foreign banks and non-bank financial institutions. Appendix I shows the map of the Chinese banking system.

According to the statistics from CBRC, at the end of 2008, the total assets of banking industry were CNY 62,391.29 billion while total liabilities are CNY 58,601.56 billion. The following table indicates the total assets and total liabilities of different levels of financial institutions.

[4] **A joint-stock commercial bank** was formerly used for a commercial bank (one that is a partnership); as opposed to a bank that is a public limited company.

Table 3.1: **Total Assets & Total Liabilities of the Chinese Banking Institutions**

CNY Billion; %

End of 2008	SOCBs	JSCBs	CCBs	Others
Total Assets	31,835.80	8,813.06	4,131.97	17,610.47
YOY Change	13.7%	21.6%	23.7%	25.8%
Market Share	**51.0%**	**14.1%**	**6.6%**	**28.2%**
Total Liabilities	29,878.36	8,368.39	3,865.09	16,489.72
YOY Change	13.0%	21,1%	22.6%	26.1%
Market Share	**51.0%**	**14.3%**	**6.6%**	**28.1%**

Source: CBRC, 2009c.

***Others** include policy banks, RCBs, UCCs, RCCs, foreign banks, finance companies affiliated to enterprise groups, trust and investment companies, financial leasing companies, auto financing companies, money brokers and postal savings.*

3.1 Evolution of the Chinese Banking System by Capital

A. The reform of the Chinese banking system

In the mid 1980s, the Big Four were established as fully state-owned enterprises. At that time, capital was not clearly defined. In the late 1980s and early 1990s, a banking system for middle and small joint stock commercial banks was established, while in 1991, Shenzhen Development Bank became the first Chinese bank to issue shares in order to raise capital in domestic stock markets. Subsequently, almost all banks in China started to pay more attention to capital and raise capital in the capital market.

B. Laws and regulations governing bank capital

On September 29, 1993, the Corporation Law was enacted, although it did not come into effect until July 1, 1994. This signalled the first time in Chinese history that capital requirements of a corporation were specified by law. Enacted in 1995, the Commercial Bank Law, the first banking law in China's history, stated that the capital

adequacy for all banks must not be lower than 8%. This was not enforceable, however, as there were no specific rules for the requirement. In 1996, following the same approach as Basel I and Chinese Commercial Bank Law, PBC published an important regulation called "Asset Liability Ratios Management of Commercial Banks: Measurement, Controlling, Monitoring and Evaluation".

C. Capital injection efforts to increase the capital level

In 1998, China's Ministry of Finance issued special treasury bonds of CNY 270 Billion for the first time, and injected them into the Big Four banks to recapitalize the banks up to the 8% capital adequacy ratio. The second wave started in December 2003 with USD 22.5 Billion capital injections in the two best-performing SOCBs - CCB and BOC. The third wave occurred in April 2005 with the injection of USD 15 Billion into ICBC.

D. Efforts to take over NPLs (non-performing loans) and commercialize the Big Four banks

In 1995, the mandate of the Big Four banks was reduced and their policy lending business was transferred to three new policy banks, ADBC, Chexim, and CDB. In 1998, four asset management companies, solely owned by the Ministry of Finance, were established and they took over a total of CNY 1.4 Trillion (USD 168 Billion) worth of NPLs from the Big Four banks. By then, BOC and ICBC had started planning to become listed banks.

E. Financial liberalization effort

Financial liberalization is another important element of bank reform in China to reduce government intervention in the banking system by introducing market practices, freeing interest rates, opening up to foreign competition, and liberalizing both exchange rates and capital accounts. For example, a crucial milestone in the financial liberalization process was the conclusion of negotiations for China's accession to the World Trade Organization in late 2001. The commitments agreed upon under the WTO led to the full opening up of the Chinese banking system to foreign affiliates by the end of 2006.

F. Regulation and supervision improvement

Bank restructuring and liberalization measures have been accompanied by improvements in regulation. In 1995, capital adequacy requirements were introduced in all commercial banks, as wells as ratios such as the loan to deposit or assets, and assets to liquid liabilities. In 2002, PBC established the international five-tier loan classification, although it was not made compulsory. With the establishment of the CBRC in 2003, supervision has significantly improved through managing of asset quality, capital adequacy, and general supervisory matters. The five-tier loan classification system was in place and fully enforced in all banks by the end of 2005. In early 2004, the "Regulation on Commercial Bank Capital Adequacy" was released. It is based primarily on Basel I, and incorporates Pillar 2 and Pillar 3 of Basel II (Zhongyang Chen, 2004). Efforts have also been made to improve bank corporate governance through the creation of shareholder boards with external directors. Moreover, disclosure of information is required for all banks. This is particularly important for listed banks, which must go through an auditing process as well as the publication of more comprehensive balance

sheets and income statements. On February 1st, 2005, the "Internal Rating Methods of Commercial Banks" was put into effect, which was a big step towards reaching the IRB Approach requirement is set by Basel II.

Based on the changes discussed, there were three main steps in the process of the reform of the Chinese banking system. First, the banking system was restructured by cleaning up the non-performing loans (NPLs)[5] and injecting of public capital, especially in the Big Four banks. The second step was to liberalize the financial system through the gradual release of quantity and price controls, the opening-up of banks to foreign competition, and by moving towards capital account liberalization. The last step was to strengthen financial regulation and supervision, and make efforts to improve corporate governance and transparency. As a result, the Chinese banking system has made great progress.

Based on the above-mentioned information, I summarize the key events in the following table.

[5] **A non-performing loan** is a loan that is in default or close to being in default. Many loans become non-performing after being in default for 3 months, but this can depend on the contract terms.

Table 3.2: **Timeline of Evolution for Capital item**

Time	Events
Mid 1980s	capital was not clearly defined
Late 1980s	JSCB system established
1991	the first bank issued shares in stock market
July 1994	the Corporate Law took effect
1995	the Commercial Bank Law enacted (capital adequacy must not be lower than 8%); the Big Four banks transferred policy lending business to three new policy banks
1998	China's Ministry of Finance issued bonds CNY270 B and injected them into the Big Four banks; four asset management companies established and took over CNY1.4 T worth of NPLs from the Big Four banks
2002	PBC published five-tier loan classification
December 2003	USD 22.5 B injected in CCB and BOC
January 2004	"Regulation on CB Capital Adequacy" was released, which was based on Basel I and Pillar 2 and 3 of Basel II
February 2005	"Internal Rating Methods of CB" was issued
April 2005	USD 15 B injected in ICBC
December 2005	five-tier loan classification was enforced for all banks
December 2006	fully opening up the Chinese banking industry

Source: Zhongyang Chen, 2004.

3.2 Features of Current Chinese Banking System

According to Table 3.1, it is obvious that SOCBs and JSCBs are the biggest components in the Chinese banking industry. Some of these banks are on par with world-class banks in terms of size of assets and capital, as well as quality of assets and profitability. However, most of the other banks do not meet Chinese average bank standards and are far below the standards of top global banks.

The following is the detailed analysis of the Chinese banking system in terms of size of assets, capital adequacy, quality of assets and profitability. In addition, there is a general review of the internal rating system of Chinese banks'.

3.2.1 Size of Assets

The assets of the Big Four banks (ICBC, ABC, BOC and CCB) are relatively large. At the end of 2006, ICBC was ranked the third largest bank in Asia in terms of size of total assets, trailing only two Japanese banks. Table 3.3 shows the recent development of total assets of major Chinese commercial banks with the world ranking in 2006. The high saving rates as well as the strict restriction of international capital transactions in China have assisted Chinese banks in increasing deposits, which are the main source of funding. Public and governmental capital injection, IPOs, and investments of foreign strategic banks or organizations have allowed Chinese banks to diversify their source of funding.

Table 3.3: **Total Assets of Major Commercial Banks**

The Top 1000 World Banks 2007 List (12/2006)	Total Assets by 12/06 (US$B)	Year on year change (%)	World Ranking
Chinese SOCBs			
ICBC	961.6	16.3	20
CCB	697.7	18.8	28
ABC	684.3	12.0	29
BOC	682.3	12.4	30
BOCOM	220.2	20.8	69
Chinese JSCBs			
China Merchants Bank	119.6	27.3	108
China CITIC Bank	90.5	15.5	127
China Minsheng Banking	89.7	25.7	129
Shanghai Pudong Development Bank	88.3	20.2	134
Industrial Bank	79.1	30.3	145
Huaxia Bank	57.0	25.0	176
Shenzhen Development Bank	33.4	13.7	246
China Zheshang Bank	4.7	67.6	793
Bohai Bank	2.0	Na	962
World Top 3 Banks			
UBS	1,963.87	16.3	1
Barclays Bank	1,956.79	7.8	2
BNP Paribas	1,896.94	14.5	3

Source: The Banker, 2007. Among Chinese JSCBs, only nine of them listed in The Top 1000 World Banks 2007 .

3.2.2 Capital Adequacy

According to Table 3.2, early in 1995, the Commercial Bank Law stated that capital adequacy for all banks should be no lower than 8%. In 1996, PBC published a regulation with specific rules of implementing minimum requirements for capital adequacy. CBRC established a regulation requiring commercial banks to keep the capital

adequacy ratio above 8% after January 1, 2007. It was reported that over 66% of Chinese banks had met that requirement at the end of 2006. The capital adequacy ratio has in fact increased dramatically in recent years, although by the end of 2006 one SOCB (ABC) and two JSCBs (China CITIC Bank and Shenzhen Development Bank) had not yet met the requirement. Table 3.4 illustrates this information in greater depth, and shows that all the five SOCBs fall within the list of Top 100 World Banks. Three of these banks are in the top 20 in terms of Tier 1 capital.

Table 3.4: **Amounts of Tier 1 Capital and Capital Adequacy Ratios of Major Commercial Banks**

The Top 1000 World Banks 2007 List (12/2006)	Strength Tier One Capital (US$B)	Year on year change (%)	World Rating	BIS Capital Ratio (%)
Chinese SOCBs				
ICBC	59.2	80.8	7	12.58
BOC	52.5	62.1	9	11.73
CCB	42.3	16.2	14	12.11
ABC	11.4	12.1	65	-17.56
BOCOM	10.6	15.1	68	10.83
Chinese JSCBs				
China Merchants Bank	6.8	123.3	101	11.40
China CITIC Bank	4.0	45.8	159	2.84
Shanghai Pudong Development Bank	3.0	58.6	190	9.30
China Minsheng Banking Corp.	2.4	20.7	229	8.12
Industrial Bank	2.0	31.0	259	8.71
Huaxia Bank	1.4	11.9	335	8.28
Shenzhen Development Bank	0.8	26.5	474	3.71
Bohai Bank	0.6	Na	589	62.62
China Zheshang Bank	0.2	18.3	999	11.87
World Top 3 Banks				
Bank of America Corp.	91.07	23.0	1	11.88
Citigroup	90.90	14.5	2	11.65
HSBC	87.84	18.1	3	13.54

Source: The Banker, 2007.

3.2.3 Quality of Assets

The asset quality of Chinese banks has improved a lot. According to a statistic from CBRC, the ratio of NPL to total loans of SOCBs (not including BOCOM) was 20.36% at the end of 2003, which was much higher than that of other emerging markets.

For example, the ratio of NPL for Eastern Europe banks in 2003 was 9.1%. This number was even worse before the Chinese government started the restructuring in 1997.

Through the reform, in particular by setting up four asset management companies to take over NPLs from the Big Four banks, almost all Chinese banks showed NPL to loan ratio improvement. According to the CBRC, by the end of 2006, the NPL to total loan ratio of the Big Four banks was 9.22% while that of 12 JSCBs was 2.81%, and the ratio of the total Chinese banks was 7.51% (CBRC, 2007a). The details are listed in Table 3.5.

In addition, by the end of 2008, the NPL ratio of five SOCBs had decreased to 2.81%, for JSCBs it had dropped to 1.35%, and the total for all Chinese banks had reached a historical low of 2.45% (CBRC, 2009a).

Table 3.5: **Quality of Assets of Major Commercial Banks**

The Top 1000 World Banks 2007 List (12/2006)	**NPL To Total Loan (%)**
Chinese SOCBs	
BOCOM	2.53
CCB	3.29
ICBC	3.79
BOC	4.04
ABC	23.43
Chinese JSCBs	
China Zheshang Bank	0.00
Bohai Bank	0.01
China Minsheng Banking Gorp.	1.23
Industrial Bank	1.53
Shanghai Pudong Development Bank	1.80
China Merchants Bank	2.12
China CITIC Bank	2.50
Huaxia Bank	2.73
Shenzhen Development Bank	7.98
World Top 3 Banks (in terms of total assets)	
UBS	0.60
Barclays Bank	1.80
BNP Paribas	3.12

Source: The Banker, 2007.

3.2.4 Profitability

In 2003, Chinese banks had 3.05% ROE (Return on Equity) and 0.14% ROA (Return on Asset). These ratios were much lower than international standards, for example, Eastern Europe banks had 13.57% ROE and 1.43% ROA. The main reason for low profitability was low asset quality at the time, resulting in a high level of default.

After a series of reforms, Chinese banks made significant progress in raising the ROA. This is summarized in Table 3.6.

Table 3.6: **Profit and Indicators for Profitability of Major Commercial Banks**

The Top 1000 World Banks 2007 List (12/2006)	Pre-Tax Profit (US$M)	Year on year change (%)	Cost-to-Income (%)	ROA (%)
Chinese SOCBs				
BOC	8,700	26.3	46.32	1.28
CCB	8,416	18.7	Na	1.21
BOCOM	2,229	35.5	47.66	1.01
ICBC	9,229	21.4	36.3	0.96
ABC	1,561	54.7	Na	0.23
Chinese JSCBs				
China Zheshang Bank	52	187.3	Na	1.11
China Merchants Bank	1,291	52.0	38.28	1.08
China CITIC Bank	897	30.5	39.67	0.99
Shanghai Pudong Development Bank	773	39.1	Na	0.88
Industrial Bank	646	43.0	Na	0.82
Shenzhen Development Bank	255	212.2	Na	0.77
China Minsheng Banking	682	25.6	58.74	0.76
Huaxia Bank	309	20.4	Na	0.54
Bohai Bank	-31	Na	Na	-1.57
World Top 3 Banks (in terms of total assets)				
UBS	12,019	12.4	69.77	0.61
Barclays Bank	14,009	35.2	58.69	0.72
BNP Paribas	13,921	25.5	61.07	0.73

Source: The Banker, 2007.

3.2.5 Chinese Banks' Internal Rating System

Adoption of an internal rating system is critical to implementing Basel II. Banks in China have put forth great efforts to improve their internal rating system and use

multiple rating mechanisms, such as their mechanism for company credit ratings, the lending risk classification mechanism, and the banks' subsidiary and branches rating mechanism. However, these mechanisms are not well developed and have significant weaknesses compared to the internal rating system proposed by Basel II.

Up until 2002, Chinese banks had complied with the requirements of the Treasury and PBC, and did not establish their own lending classification system to manage loans. As a result of review, transformations in the banking system took place. This occurred in three distinct phases:

A. Before 1998, Chinese banks implemented "The Rules of the Finance and Insurance Corporate" issued by the Treasury in 1988. It classified loans into five different levels. The last three levels were also known as "One Delay Two Lose" or "Bad Loans" in the Chinese banking industry.

B. Since May 1998, Chinese banks have started to implement "The Guide of Lending Risk Classification" issued by PBC. This guide sorted loans into to five tiers. It is also called the "Five Tier Classification".

C. Since January 2002, PBC has required all of the banks in China to implement "The Guide".

In conclusion, through improvement and development in a variety of areas, the Chinese banking system has made significant progress in many aspects including capital adequacy, NPL as well as profitability ratios. In comparison to this progress, the development of internal rating systems aspect lags far behind.

4 Implementation of Basel II in China

In this Chapter, I explain the reasons that the Chinese banking system must implement Basel II and discuss the efforts of CBRC and the Chinese banks to adopt Basel II. Moreover, based on the current situation of the Chinese banking sector, I summarize the challenges for the Chinese banking sector to completely implement Basel II, which cover three Pillars and the IRB Approach.

4.1 Rationale to Implementing Basel II

Basel II is widely recognized as the future direction for risk management development. The implementation of Basel II will promote the development of banking supervisory technology, enhance the effectiveness of market discipline, and improve the security of the international banking system. Even though it is not required that Chinese banks to implement Basel II at this time, it still has profound implications for the Chinese banking industry.

A. Enhancing the Competitive Advantage

The IRB Approach is one of the main innovations of Basel II, which is used as a tool to calculate credit risk capital. Although BCBS assumes that the majority of banks will initially operate under the current standardized approach, many banks, especially the major international active banks, will switch to the IRB Approach in the near future. Thus, Chinese banks may attract much less capital in the market due to increased competitive pressure from banks that have adopted the more finely tuned IRB Approach and received

much more capital as result. Therefore, adoption of the IRB Approach will further enhance the existing competitive advantages of those internationally active banks. This may result in a trend toward consolidation, which means that some of the Chinese banks will be squeezed out of business by those major international active banks. This will further intensify the current trend of a strong increase in the proportion of foreign banks' control of Chinese banks.

B. Following the Progress and Development of Financial Industry

Basel II is the "Bible" of the international banking industry. Most member countries and some non-member countries employ Basel II in the management of their international banking activities. Meanwhile, Basel II is the international criteria used by the banking authorities to evaluate the capital adequacy and the supervisory ability of international banks. If China does not initiate Basel II, it will not be able to keep up with the progress and development of the international financial industry and will miss opportunities to share its experience and knowledge. Furthermore, choosing not to adopt Basel II will put the Chinese banking industry in a disadvantageous situation in terms of competition and cooperation. The lack of regulatory measures, such as those dictated by Basel II, will also impede the objective of realizing sound financial surveillance in the Chinese banking industry.

C. Maintaining the Consistency of a Market Economic Policy

Basel II reflects the basic rule of a market economy. After 1978, the Reform and Open Policy[6] helped China to maintain an average of 8% GDP growth. Since 1992, China's economic reforms have changed the country from a planned economy to a market economy. This change facilitated China's economic growth and globalization process. China has been making a tremendous effort to build its global identity as a market economy. Basel II implementation in the Chinese banking industry is a key method by which many developed countries may evaluate the sincerity of China's new market economic approach. Faced with important rule changes in the international financial industry, China should take advantage of this opportunity and implement Basel II. This would show China's dedication to transforming its planned economy to a market economy. If implementation does not occur, it will damage the consistency and image of China's economic policy and its contribution toward globalization progress; hence jeopardizing the promising future of China's economic growth.

D. Reducing the Gap of Experience and Technology

Basel II is an important improvement that has combined financial mathematics, statistics, information technology theory, management theory, investment theory, probability theory, and other advanced theories. It represents new technological trends in risk management, such as effective internal control, cautious and reasonable risk taking, precise risk evaluation, and risk-sensitive capital surveillance. Not implementing Basel II

[6] **Reform and Open policy** was issued in December 1978. The Central committee of the Communist Party of China held a historic meeting in Beijing, at which two important decisions were made. One was to open the door of China to the outside world, and the other was to invigorate the national economy through reform. As it turned out, the meeting marked a new page in the annals of Chinese history. Since then, China has embarked on a gradual switch from the planned economy to what we call the socialist market economy.

will result in a new technological barrier between Chinese and international financial industries. China will lose a great opportunity to shorten the knowledge gap of risk management experience and technological expertise between Chinese financial experts and those from Western countries. China would do best to master this knowledge from practice and being included in the process.

E. Getting the Support from IMF and World Bank

Without adopting Basel II, China will not be in a favourable position to obtain economic aid and low interest loans from the IMF and the World Bank Group. The IMF and the World Bank Group have always been strong supporters of BCBS. The IMF normally uses the surveillance rules set by BCBS as the criteria and mechanism to evaluate the soundness of the financial environments of each country. Additionally, it often forces member countries to implement and abide by those rules. The World Bank Group also uses technological support projects to cajole their beneficiaries into implementing these rules; otherwise, the beneficiaries lose its assistance.

F. Lowering the Costs of Raising Money

If China fails to become Basel II compliant, costs to banks of raising money from international financial markets and of being listed in foreign stock exchanges will increase. This is because the international rating agencies evaluate international banks based on the rules set by Basel II. Banks, companies, and other organizations from non-member countries, including China, will get much lower ratings than those from member countries, due to their failure to implement Basel II. International banks and investors tend to believe that the risk level in China is much higher than in developed countries, and these investors will be reluctant to invest in Chinese banks or companies. For

example, in 2006 Chinese banks and security companies received evaluations ranging from BB+ to below B- according to the standard approach set by Basel II, so at the time it was difficult for them to raise money from foreign investors due to this designation as high-risk.

G. Obtaining the Opportunity of Expending Businesses and Opening New Branches

If China does not comply with the prerequisites of Basel II, Chinese banks will have trouble expanding business and opening new branches in developed countries. In order to open a new branch in a developed country, a bank must comply with Basel II, according to the requirements of the surveillance authorities of the host country. If the head office of a bank still uses Basel I, the operational costs and difficulties in managing risk will be increased.

In conclusion, there is no doubt that China should implement Basel II in the near future. It would help China's financial institutions enter into the global financial market, as well as effectively manage their risks.

Therefore, understanding of the basic requirements of Basel II implementation is essential for the Chinese banking industry.

4.2 Basic Requirements to Implement Basel II

I will now summarize the following as the most fundamental requirements for banks to implement Basel II according to recommendations by IMF and World Bank in 2005 (See Appendix J).

4.2.1 For Pillar 1

In short, Basel II capital adequacy rules are based on a so-called “menu” approach. Banks and regulators are offered two distinct sets of options for computing credit risk capital charges: (I) Two standardized approaches based on external credit assessments; and (II) Two IRB Approaches that use internal ratings based on banks’ own data. For operational risk, banks and regulators can choose either: (I) the Basic Indicator Approach, based on overall income; (II) the Standardized Approach, based on income of business lines; or (III) the Advanced Measurement Approach (AMA), based on internal models, and using actual loss data. The minimum requirements for the advanced approaches are technically demanding and require extensive databases and more risk management techniques.

Based on the above, four essential requirements have become concerns for the banking industry. First, banks should have their own meaningful differentiation of credit risk, and need to enhance the ability to provide supervisory estimates of LGD and EAD. Banks should also establish the necessary database and IT systems to ensure to produce the required data for calculating Basel II capital adequacy. Next, banks should set up an integrated internal rating system. Finally, the regulator should have the ability and capacity to qualify rating agencies and map agency scores.

4.2.2 For Pillar 2

The basic requirement here concerns supervisory ability and capacity. This means that supervisors need to make necessary assessments in terms of Basel II implementation. At the same time, Pillar 2 requires supervisors to establish an adequate legal and regulatory framework to support Basel II adoption.

4.2.3 For Pillar 3

Pillar 3 first requires that the information systems of banks produce breakdowns to aid information disclosure. Building accounting and auditing systems are another core requirement of Pillar 3, which means that the systems should safeguard the accuracy of disclosures. In addition, those systems are required to have the ability to ensure disclosure, supervision and verification.

After an overview of requirements, next step is to survey the efforts that Chinese regulator and banks have been making.

4.3 Efforts Made by the Chinese Banking System

As previously mentioned, CBRC was established in 2003 and is an agency of the Chinese government, authorized by the State Council to regulate the Chinese banking sector (Wikipedia, 2009b). In order to achieve the Chinese banking sector's financial stability, facilitate financial innovation, establish a fair and orderly competition environment, as well as to improve Chinese banks' international competitiveness, CBRC has several main functions in terms of regulatory activities (CBRC, 2009d). These functions are (a) formulating supervisory rules and regulations governing the banking institutions, (b) conducting on-site examination and off-site surveillance of the banking institutions, and (c) publishing statistics and reports of the overall banking industry in accordance with relevant regulations. CBRC focuses on consolidated supervision to assess, monitor and mitigate the overall risks of each banking institution as a legal entity; risk-based supervision and improvement of supervisory process and methods; and supervisory transparency in line with international standards and practices (CBRC, 2009d).

In early 2003, when BCBS was compiling comments on the third consultative paper on Basel II, Liu Ming Kang, Chairman of CBRC, on behalf of CBRC and the Chinese banking sector, to wrote a letter with comments on Basel II to Mr. Jaime Caruana, Chairman of BCBS. Since then, the Chinese regulator (CBRC) and banks have been engaged in completing the necessary preparation for fully adopting Basel II.

4.3.1 Regulator's Endeavour

By October 2002, PBC had set up ICBC, CCB, BOC, CDB and China CITIC Bank, which varied in size, to participate in QIS3[7]. Of these five banks, three were SOCBs, one was a policy bank and one was a JSCB. They represented the general condition of the Chinese banking industry, and also reflected the Chinese regulator's positive attitude towards Basel II implementation in the near future. At the time, PBC was the Regulator of the Chinese banking industry.

The first and most important act of the newly set up regulator, CBRC, was the letter that CBRC Chairman Liu Mingkang sent to BCBS Chairman Jaime Caruana on July 31, 2003. On behalf of CBRC, Chairman Liu showed his strong support for the objectives of Basel II and stated that Basel II is based on the conceptual advances in regulatory theories and emerging best practices for risk management in developed markets (CBRC, 2003). Also, Chairman Liu noted that due to Basel II, the risk management of Chinese banks had begun to evolve at an accelerated pace (CBRC, 2003).

In addition, Chairman Liu pointed out that following extensive deliberation, Chinese banks would remain on Basel I for at least a few more years after the G10

[7] **QIS3** means the Third Quantitative Impact Study of Basel II. QIS1 and QIS2 had been carried out in the earlier period of seeking comments for Basel II.

implementation date of 2006 (CBRC, 2003). However, in order to improve capital regulation, CBRC revised the existing capital rules and incorporated Pillar 1 and Pillar 3 to enhance supervisory review and market discipline. CBRC also stressed that banks should improve their risk management beyond the narrow compliance with a minimum capital requirement. In addition, CBRC stated that all Chinese banks should start collecting the necessary data for both borrower and facility, which serve the basis for a more quantitative approach to measuring and managing credit risk. Over time, Chairman Liu expected that CBRC would consider using the IRB Approach to capital regulation when banks were ready. Accordingly, CBRC provides incentives for banks to improve their sophistication in risk management (CBRC, 2003).

In an attachment to the letter, CBRC expressed some pertinent and meaningful comments including market conditions in non-G10 countries, risk sensitivity and treatment of small and medium-sized enterprises, and the possible adverse impact of Basel II on capital flows to developing economies (CBRC, 2003). This letter gave a rational reply to BCBS and the world in terms of whether Chinese banks implement Basel II and what the process is going on.

On January 26, 2005, CBRC held a seminar on the construction of internal rating systems at commercial banks. The Vice Chairman of CBRC, Tang Shuangning addressed the seminar and encouraged major Chinese commercial banks to speed up their process in building up internal rating systems, thus improving their risk management capacity (CBRC, 2005). Vice Chairman Tang pointed out that it was a general trend for countries throughout the world to implement Basel II. In view of the Chinese banking realities,

CBRC adopted both a "Two-Step Approach"[8] and a "Parallel System"[9] for the implementation. Based on this approach, CBRC encouraged major Chinese commercial banks to quicken their pace in establishing a sound internal rating system and improving risk management capacity. When the conditions are ripe, CBRC will conduct capital regulation on well-prepared major commercial banks in line with the IRB Approach under Basel II (CBRC, 2005).

On December 21, 2006, CBRC held a teleconference to plan the implementation of Basel II in domestic banks (CBRC, 2006). CBRC Chairman Liu delivered a speech and pointed out that the new CBRC guidelines("The Guidelines") for Basel II implementation by the Chinese banking industry, were about to be publicized. In The Guidelines, three directions were specifically stipulated, as follows (CBRC, 2006):

A. Large Chinese commercial banks that have overseas operational entities and substantive international business are required to implement Basel II, while the small- and medium-sized Chinese commercial banks can choose to implement Basel II on a volunteer basis.

B. Chinese commercial banks are requested to calculate capital requirements for credit risk with the IRB Approach, and this is especially recommended and encouraged to practice Advanced IRB Approach.

[8] T**wo-step approach** means that CBRC continuously concentrated on the implementation of the "*Regulation Governing Capital Adequacy of Commercial Banks"* as well as encouraged major Chinese commercial banks to establish an internal rating system.

[9] **Parallel System** refers to a system under which (in the future), well-prepared major commercial banks are subject to capital regulation in line with Basel II, while the other banks are subject to capital regulation in accordance with the "*Regulation Governing Capital Adequacy of Commercial Banks"*.

C. The large-sized Chinese commercial banks should implement Basel II from the end of 2010, and if could not meet the minimum requirements set by CBRC, they would be granted 3 years of graceful period after approval.

On March 13, 2007, CBRC formally issued "The Guidelines on the Implementation of the New Basel Accord by China's Banking Sector". These Guidelines are formulated with a view to steadily pushing forward the adoption of Basel II in China and enhancing the effectiveness of the capital regulation, thus underpinning the stability of the Chinese banking system (CBRC, 2007b). The second section of "Objectives and Principles of Basel II implementation" indicated that considering current development status and external environment, the Chinese banking conditions had been not yet mature for all Chinese banks to implement fully Basel II (CBRC, 2007b). Therefore, CBRC brought out three principles for the Chinese banking sector to implement Basel II (CBRC, 2007b).

A. Banks in different size are subject to different capital regulation requirements. The detail information was mentioned in the teleconference of December 2006.

B. Implementation of Basel II by the Chinese banking sector should proceed gradually. Based on this step, CBRC allowed banks to move to Basel II at different periods of time, which is aimed at making sure banks are fully prepared for rather, than irrationally rushing into, implementation. This would ensure the effectiveness of Basel II adoption.

C. Banks are permitted to meet Basel II standards step by step. In Basel II, there are many conditions stipulated for the use of the capital measurement

approach. However, it is a long-term process, and the standards are met gradually, rather than all at once. Therefore, banks must, based on their own situation, make an overall plan and meet the Basel II standards in a phased, well-sequenced manner.

The Guidelines also mentioned a clear timeline for Basel II implementation (CBRC, 2007b).

A. Before the end of 2008, CBRC will successively issue supervisory rules regarding Basel II implementation and make amendments to the existing capital regulation requirements by taking into account public opinions.

B. CBRC will conduct QIS in 2009 so as to evaluate the impact of Basel II implementation on the capital adequacy of banks.

C. Banks employing Basel II should start the implementation at the end of 2010. If by then, banks fail to meet the minimum requirements set by CBRC, they may postpone their implementation to 2013 with CBRC's approval.

D. Any bank which plans to adopt Basel II should make an official application to CBRC at least six months prior to the adoption. CBRC will start to accept such applications from the beginning of 2010.

E. Other banks may propose an application for Basel II implementation after 2011, by going through the same procedures as Basel II banks do.

F. Other banks should be subject to the revised capital regulation requirements beginning at the end of 2010. If Basel II banks have not started Basel II

implementation by then, they will also be subject to the revised capital regulation requirements.

Following these Guidelines, CBRC published "Guidelines on Operational Risk Management of Commercial Banks" in June 2007.

In May 2008, CBRC established the High-Level Committee (HLC) to promote Basel II implementation in the Chinese banking industry. CBRC Chairman Liu headed this HLC, and other members were CBRC senior officials and senior executives of major Chinese commercial banks (CBRC, 2008a).

In August 6, 2008, CBRC held the first HLC meeting. At this meeting, CBRC Basel II Research and Implementation Taskforce[10] reported the general framework for the implementation and proposed a draft of five pieces of guidance for HLC to review (CBRC, 2008a). In addition, this meeting made it clear that the years 2008 and 2009 would be a time of preparation for Basel II implementation, and that CBRC would start to process implementation applications of Chinese commercial bank starting in 2010. During the next the couple of years, both CBRC and Chinese commercial banks should fully understand the relationship between the three pillars of Basel II and ensure balanced implementation (CBRC, 2008a).

In September 2008, CBRC announced that it had made significant progress in rule-making for Basel II implementation and released the first set of rules for Basel II implementation in China. The first set of rules consists of five sets of guidelines: "*The Guidance on Classifying Credit Risk Exposure in Banking Book of Commercial Banks"*;

[10] The **Taskforce** was established in May 2006, and its purpose was to assist Chinese banks in preparing for Basel II implementation.

"*The Supervisory Guidance on Internal Rating System for Credit Risk of Commercial Banks"*; "*The Guidance on Regulatory Capital Measurement for Special Lending of Commercial Banks"*; "*The Guidance on Regulatory Capital Measurement for Credit Risk Mitigation of Commercial Banks"* and "*The Guidance on Regulatory Capital Measurement for Operational Risk of Commercial Banks"* (CBRC, 2008c). This set of rules provided clear and practical prudential requirements. In addition, the announcement told that besides these five pieces of guidance, more rules would come by either the end of 2008 or the first half of 2009 (CBRC, 2008c).

On December 11, 2008, CBRC announced that it was seeking public comments on eight documents under the framework of the Basel II rule-making initiative up until the end of 2008 (CBRC, 2008b). The eight documents included: (1) Supervisory Guidance-Internal Model Approach to Capital for Market Risk; (2) Supervisory Guidance-Interest Rate Risk on Banking Book; (3) Supervisory Guidance-Liquidity Risk Management; (4) Supervisory Guidance-Information Disclosure on Capital Adequacy Ratio; (5) Supervisory Guidance-Validation of AMA Approach; (6) Supervisory Guidance-Calculation of Capital Adequacy Ratio; (7) Supervisory Guidance-Regulatory Capital for Exposure in Asset Securitization; and (8) Supervisory Guidance-Supervisory Review for Capital Adequacy Ratio (CBRC, 2008b).

On February 17, 2009, CBRC put out public notice that it was seeking comments on four Basel II documents, which were released for the purpose of seeking worldwide consultations by BCBS in January 2009. These papers were: (1) Principles for sound stress testing practices and supervision; (2) Revisions to Basel II market risk framework;

(3) Guidelines for computing capital for incremental risk in the trading book; and (4) Proposed enhancements to Basel II framework (CBRC, 2009b).

The most recent action by CBRC is that it issued “Guidelines for the Supervision of the Internal Rating System for Credit Risk of Commercial Banks” and “Guidelines on the Categorization of Banking Book Credit Risk Exposures of Commercial Banks” in April 2009 (CBRC, 2009e).

The following table is the timeline about the important events above-mentioned.

Table 4.1: **The list of progress for CBRC in terms of Basel II Implementation**

Time	Events
October 2002	PBC organized ICBC, CCB, BOC, CDB and China CITIC Bank to participate QIS3.
July 2003	CBRC Chairman Liu wrote a letter to BCBS Chairman Caruana in terms of the Chinese banking sector's attitude to Basel II implementation.
January 2005	In a seminar, CBRC Vice Chairman Tang encouraged major Chinese commercial banks to speed up their process in building up internal rating systems.
May 2006	CBRC set up Basel II Research and Implementation Taskforce to assist Chinese banks in preparing for Basel II implementation.
December 2006	CBRC held a teleconference for planning implementation of Basel II by domestic banks.
March 2007	CBRC issued "The Guidelines on the Implementation of the New Basel Accord by China's Banking Sector".
June 2007	CBRC published "Guidelines on Operational Risk Management of Commercial Banks".
May 2008	CBRC established the High-level Committee (HLC) to promote Basel II implementation in the Chinese banking industry.
August 2008	CBRC held the first HLC meeting.
September 2008	CBRC released the first set of rules that included five "Guidelines" for Basel II implementation.
December 2008	CBRC announced that seek public comments on eight documents under the framework of Basel II rule-making initiative.
April 2009	CBRC issued "Guidelines for the Supervision of the Internal Rating System for Credit Risk of Commercial Banks" and "Guidelines on the Categorization of Banking Book Credit Risk Exposures of Commercial Banks".

4.3.2 Banks' Efforts

Most of the Chinese banks have paid close attention to the development of Basel II. Many of them had made great achievements, which are listed below:

ICBC. With the QIS3 opportunity, it launched an overall internal rating project. It had finished its internal MIS integration and compiled a relatively satisfactory database.

BOC. In order to experiment in its Hong Kong Branch, it enlisted experts from overseas institutions to establish an internal rating system. It also enforced a twelve-tier loan quality classification system in Mainland China.

CCB. Its risk rating system received approval by the Seminar's evaluation as well as from Morgan Stanley and Standard & Poor's operation tests, of which the model performance was higher than other Asian banks in the early stage.

BOCOM. As a leader in JSCBs, it achieved solid progress in developing an internal rating system.

China CITIC Bank and China Merchant Bank. They made positive progress in developing internal rating systems.

According to the mentioned previously letter of July 2003, large-sized banks had launched ambitious projects to build a two-dimensional rating system in line with Basel II, while medium- and small-sized banks had been also actively introducing elements of Basel II in the best way they could (CBRC, 2003).

In addition, the Chinese banking industry has held five international seminars about the IRB Approach of Basel II. On July 15, 2004, at the fifth seminar, CBRC Vice Chairman Tang announced that China had made some periodic achievements in building internal rating system in the Chinese banking industry.

After CBRC was established, Chinese banks followed their regulator's schedule and arrangements and consequently prepared for Basel II implementation. For example, according to "The Guidelines on the Implementation of the New Basel Accord by

China's Banking Sector", which was issued in March 2007, Basel II banks[11] were told to adopt Basel II and were required to complete the design of the plans by the end of October 2007 (CBRC, 2007b).

4.4 Challenges in Implementing Basel II

After the review of efforts of Chinese regulator and banks had made to implement Basel II, I will analyze and discuss the challenges in implementing Basel II, which includes three Pillars and the IRB Approach.

4.4.1 For Pillar 1

Challenge A: Meeting the Minimum Capital Requirement.

Implementing Basel II will increase overall capital for the Chinese banking sector. According to QIS3 in 2002, the banks' overall capital requirement increased 12% under the Standardized Approach. Five different sized Chinese banks, which represented 48% of total assets of all financial institutions in China, had participated QIS3. Under the Standardized Approach, the total risk-weighted assets of those five Chinese banks increased by 9.02%, whereas the contribution of credit risk is 5.19% and that of operational risk 3.83% (CBRC, 2003).

Although Basel II contains a simplified approach as an alternative to the standardized approach for less developed markets, there will not be reduction in credit risk capital charge to offset new operational capital charge. Therefore, it will be

[11] **Basel II banks** referred to those large-sized banks with operational entities in other countries or regions (including Hong Kong, Macao and Taiwan) and with large proportion of international businesses.

unavoidable to increase overall capital for Chinese banks while implementing Basel II (CBRC, 2003).

Challenge B: Charging Additional Capital for Operational Risk

Banks and supervisors throughout the globe all believe that with the current state of techniques, operational risk is very difficult to measure. Besides adopting the standard approach, banks are required to charge additional capital for operational risk that is equal to a fixed percentage of average annual gross income over the previous three years. However, this is not risk sensitive, and not likely to provide the impetus for banks to measure and manage operational risk. Meanwhile, capital charge for operational risk also contributes to an increase of banks' overall capital.

Challenge C: Implementing Standard Approach

Basel II provides different methods for calculating capital each for credit risk, market risk and operational risk (refer to Appendix F). The basic approach for each risk is the Standard Approach. However, it is still very difficult to adopt the Standard Approach for three risks. For example, Basel II requires that banks use risk weight for these assets, normally loans, based on the external ratings for credit risk. However, Chinese companies that are borrowers of these loans seldom have their own external ratings. In addition, the Chinese regulator currently has no capacity to qualify external rating agencies to provide agency ratings. Therefore, banks often give 100% risk weight to those companies when banks judge their external ratings to be unreliable. There is not enough risk sensitivity reflected in this calculation.

In addition, data collection and IT systems of banks are not sufficient to produce the required information to support banks to implement standardized methods. Meanwhile, banks need to strengthen their understanding of risks, including their own differentiation of credit risk, to adopt standard approaches.

In summary, Chinese banks are not qualified to implement standardized methods.

Challenge D: Adopting the IRB Approach

Compared to the Standardized Approach, the IRB Approach has many more requirements. It not only requires that banks have very comprehensive risk management systems, but also requires that supervisors be capable of evaluating and monitoring these systems. At this time, based on the current Chinese banking environment, CBRC is not able to provide supervisory estimates of LGD and EAD, which are used in the initial assessment for the IRB Approach. In addition, Chinese banks run different levels of risk management that construct their internal rating systems based mainly on a five-category classification method. It is impossible for banks to evaluate PD and LGD with such rating systems. Furthermore, banks are not able to calculate capital requirements precisely with such a low level risk management system.

General speaking, to implement the IRB Approach, Chinese banks face difficulties as follows. For external factors, one difficulty is that the lack of credit culture base in society could prevent the compiling of actual and effective data from borrowers for banks and regulators. For internal factors, Chinese banks' low-level rating methodology makes it very difficult to achieve the IRB Approach requirements. As well, the limited application of rating results creates little incentive for banks to implement the IRB Approach.

Now, I will conduct a detailed analysis about the weaknesses of current internal rating system in China.

The current rating method focuses too much on quantification and does not accurately reflect risks. The current method uses a formula or model, set by CBRC, to evaluate risk by applying a Scoring Method. The categories for rating and for the risk weight of each category are based on expert experience and certain financial ratios. Bankers assess ratings and give each category a score, add them together, and then determine rating levels based on the total score. This method is easy to apply; however, it has numerous weaknesses. These weaknesses are as follows.

A. The Use of Historic Data

The current model is based on past financial data, and is not a projection of the borrower's future ability to repay their debt. Normally, borrowers are evaluated by banks according to the previous three years' financial data and relative criteria; however, Basel II requires data from at least the last five years. Historic data can be used as the starting point of analysis, but not as a tool to reflect future trends. If the projection period is long, the historic data has relatively a low correlation with the future. Therefore, the use of historic data is not very reliable.

B. The Fixed Risk Weightings

The category and risk weightings lack reasonable foundations. These categories work as a whole, rather than individually. Banks should use statistical technology to find the correlation between these factors, rather than evaluate one category and then add them together. The purpose of correct statistical analysis is to avoid re-calculation of the

same factors repeatedly. More importantly, the same category has different impacts on borrowers that operate in different industries. Therefore, it is impossible to explain precisely the risk based on the fixed weight.

C. Lack of Cash Flow Analysis

The current model lacks an analysis and projection of cash flow. Cash flow is a core factor in the analysis of a borrower's future ability to pay back the loan. The current model does not analyze and project the adequacy of cash flow; hence, it cannot reflect the borrower's future ability to pay back the debt.

D. Lack of Comparable Industry Analysis

The financial markets in China lack analyses and financial studies of different industries. The position of the borrower within its own market is a key factor of credit risk. Although some commercial banks categorize the borrower according to the industry, there are not enough analyses of different industries. The rating category does not identify different characteristics of different industries, and the results of comparisons of companies from different industries are not reliable.

E. Incomplete Database

The database in Chinese banks should improve, as it is very important to check the correctness of rating criteria and the results of ratings by statistically analyzing PD and LGD of different borrowers based on historic data. However, in China, poor information technology and unsatisfactory data collection lead to a lack of preciseness of PD and LPD. The estimates of PD and LPD for a specific borrower need historic data such as default information, rating information, rating decision, rating changes,

information of loans and characteristics of the borrower. Yet, most Chinese banks have only very recently started their internal rating system, so the accumulated data does not satisfy Basel II's rating requirement.

F. The Limitation of Applying the Rating Results

The application of the ratings results is limited. Currently, most commercial banks focus more on lending management, and they pay less attention to the credit rating system. Bank managers are not aware of the importance and necessity of an internal credit rating system. Managers believe that the credit rating system should only be used as a tool for lending decisions, rather than for asset pricing, reserve decision, economic capital calculation and other considerations.

G. The Definition of Loss

The definition of loss is not clear. Normally, banks should clearly define loss first, and then rate the borrower. Foreign banks define loss from PD and LGD, while China's banks define loss as the probability of paying back the principle and interest. Chinese banks' definition of loss is too general and does not precisely describe the loss. This is a key barrier for Chinese internal credit rating system.

H. The Objective of the Rating System

Chinese banks only consider current and potential clients as the objective of rating, and do not consider the risk level of the loan itself. International banks normally adopt two level rating systems, to evaluate both the client and the specific loan.

I. Low Risk Sensitivity of Rating System

Currently, Chinese banks use a method of five-tier classification to assess loans. With the use of this method, loans are classified very generally, and risk characteristics are not clear. This general classification has relatively lower risk sensitivity and does not effectively control risk levels of specific loans.

In brief, Chinese banks will encounter many difficulties from the external and the internal while implementing the IRB Approach.

4.4.2 For Pillar 2

Pillar 2 concerns requirements for supervisory review. The introduction of supervisory review by Basel II has significant implications for banking industry. It not only introduces supervisory review of banking authorities, but also encourages banks to operate cautiously.

Challenge A: Adopting the Same Supervisory Methods

Based on the purpose of Basel II, in order to create an equal competitive market environment, supervisors of different countries should implement same supervisory methods. Nevertheless, this requirement does not seem to recognize the banking market in non-G10 countries. For example, treatment of small- and medium-sized enterprises (SMEs) will reduce the risk sensitivity of Basel II. Empirical evidence from some G10 countries suggests that most banks lending to SMEs benefit from a greater degree of diversification than those lending to larger corporations (CBRC, 2003). Such diversification in turn helps to reduce a bank's exposure to the credit risk posed by SME lending and the amount of capital required. However, in the Chinese market, SMEs are

riskier, measured both in terms of the size of non-performing loans and default rate. Chinese banks and supervisors all accept that lending to SMEs is definitely riskier than lending to larger corporations. It is true that most of the lending to SMEs is secured. Yet, the collection of default SME loans is also more difficult in comparison to the collection of loans for large companies. A lower risk weight would compromise prudential regulation and discourage prudent lending behavior (CBRC, 2003).

Therefore, this difficulty is related to whether to adopt Basel II, because implementing it in emerging markets would undoubtedly require deviation of some major provisions of Basel II (CBRC, 2003).

Challenge B: The Support for Supervision

The organizational system of supervision is not adequate. A lack of a consolidated supervisory database is one of the main reasons. Another reason relates to having no sufficient audit and accounting mechanisms that document and calculate financial health of banks under supervision. Briefly, CBRC needs more feedback while pushing banks to implement Basel II.

4.4.3 For Pillar 3

Pillar 3 addresses requirements for market discipline. This pillar is mainly concerned with establishment of a set of information disclosure rules, which enable market participants to understand related risk profiles and capital levels. The premise is that market discipline is effective in improving information disclosure levels, increasing transparency, and requiring banks to publish complete and correct information on time. Market participants can make sound decisions based on such disclosed information. The

main function of requirement of market discipline is to improve transparency and strengthen surveillance and stability.

Recent years have witnessed great progress for Chinese banks in market disclosure. First, the number of the listed banks is increasing and they strictly abide information disclosure requirements according to the listed company. In addition, many banks, which remain unlisted in order to attract more clients and responsibility for shareholders, disclose their important information related to their financial and business status on their public websites. Clearly, Chinese banks have improved significantly their external information disclosure conditions.

One challenge in implementing Pillar 3 is mainly for Chinese banks that are not listed banks. Although almost all of those banks post their information on websites, the content is not enough for market participants, especially with respect to some critical financial information. Another challenge is the consistency of standards in terms of statistics. Based on several tiers in the Chinese banking industry, there are many different statistical methods set by CBRC. Therefore, Chinese banks can only be compared within the same tier.

Table 4.2 shows the summary of the challenges Chinese banks face while they implement Basel II.

Table 4.2: **The summary of challenges and related results for Chinese banks**

Items	Challenges	Results
Pillar 1	Meeting the minimum capital requirement	Chinese banks need to increase their overall capital.
	Charging additional capital for operational risk	
	Implementing standard approach	It is hard to adopt due to lack of reliable external rating, enough data collection and efficient IT system.
	Adopting the IRB Approach	It is difficult to implement based on lack of credit culture base, current low-level rating methodology and limitation application of rating results.
Pillar 2	Adopting same supervisory methods	For some specific points, implementing Basel II will compromise prudential regulation and discourage prudent lending behaviour.
	The support for supervision	There is no enough feedback for regulator including lack of solid supervisory database and sufficient audit and accounting mechanisms.
Pillar 3	For other non-listed banks	There is no enough information disclosed by non-listed banks.
	The consistency of the statistic standard	It is not easy to compare all Chinese banks that are due to different statistical methods for several tiers divided by different ownership systems.

According to the above-mentioned information, we can draw a conclusion that "in view of the current development status and external environment, the Chinese banking conditions are not yet mature for all the banks in China to fully adopt Basel II" (CBRC, 2007b). There are so many challenges as regards three Pillars. The Chinese banking industry still needs to make many efforts to improve.

5 Recommendations

In this chapter, based on the challenges of Basel II implementation for the Chinese banking industry mentioned in previous section, I provide several recommendations with respect to the three Pillars.

5.1 Pillar 1: Focusing on the IRB Approach

In reality, CBRC has already recognized the importance of the IRB Approach to implementation, and required that Chinese banks should adopt the IRB Approach to calculate capital for credit risk, especially encouraging them to apply an advanced IRB Approach in the March 2007 Guidelines (CBRC, 2007b). In addition, CBRC provided several recommendations to Chinese banks for the IRB Approach implementation: (I) Improving risk measurement techniques; (II) Re-engineering business procedures, which means setting up sound operational processes and procedures together with organizational systems, and thereby ensuring an independent, fair and consistent outcome of internal ratings; and (III) Nourishing a risk-mitigation culture (CBRC, 2007b). In particular, CBRC indicated some key points about recommendation (I) (CBRC, 2007b):

A. Chinese banks should accelerate the development of an internal rating system and risk measurement models based on the dimensions, structures, standards and approaches stipulated in Basel II.

B. Chinese banks should develop risk measurement models to estimate credit risk and market risk of their own asset portfolios. At the same time, risk

measurement models should be reviewed and tested to improve prediction capability and stability of the models.

C. Chinese banks should actively apply the quantitative risk results in their design of plans and strategies, measurement and management of risk exposures and improvement of reporting systems.

Besides the above-mentioned recommendations by CBRC with which I am in complete agreement, I have the following two suggestions for CBRC:

A. In the process of implementing Basel II, CBRC should improve its ability and capacity to qualify rating agencies to provide effective external credit assessments, which Chinese banks could use while adopting the transitional standard approach.

B. In an attempt to nourish a risk-mitigation culture, CBRC should strengthen banks' risk management consciousness and enhance public opinion by focusing on risks, which could assist Chinese banks to cultivate risk-control culture.

5.2 Pillar 2: Focusing on a Supervisory Framework

In this section, I recommend a supervisory framework to the Chinese banking system, which is based on the framework used by the Canadian banking regulator. Canada was one of the earliest countries to adopt Basel II. The Canadian banking industry has implemented Basel II for almost two years and the Supervisory Framework is well accepted.

The intention of this Supervisory Framework is not to restrict risk taking but rather to determine whether financial institutions identify, understand, and control the risks they assume. It believes that supervising an institution is a dynamic and continuous process requiring periodic updates of its business profile and an ongoing re-evaluation of its risks and risk management practices. A holistic understanding of an institution's environment, industry, and business profile provides the context for assessing its risk profile. The exercise of sound judgment in identifying and assessing inherent risks in an institution is critical in providing a reliable reference point for the supervisory review process. The overall outcome of the risk assessment drives supervisory strategy and enforcement of formal corrective action. (OSFI, 1999)

According to the components of overview of the risk assessment process, it include significant activities, inherent risk, quality of risk management, residual risk, direction of residual risk and risk matrix. The overall outline is called the Risk Assessment Summary (RAS), which is an executive summary that highlights an institution's present financial condition, its prospective risk profile, key issues, and past supervisory findings. (OSFI, 1999)

Based on those contents, the supervisory process is divided into the following six steps: Analysis, Planning, Action, Documentation, Reporting, and Follow-up (OSFI, 1999). Table 5.1 lists the information in detail.

Table 5.1: **Map of the Supervisory Process**

STEPS	OUTPUT	TIME REQUIREMENT
1. Analysis (Understanding the institution and developing a risk profile)	• Risk Matrix • Risk Assessment Summary (RAS)	• Every three months for sound institutions • Every month for institutions with existing destabilization.
2. Planning (Scheduling and planning activities for the supervisory period)	• Supervisory Plans (by Institution, Division, Group and Sector)	• At the beginning of each fiscal year
3. Action (Conducting on-site reviews and on-going monitoring)	• Information requests	• Quarterly visits for larger institutions
4. Documentation (Preparing and filing information to support findings)	• Section Notes • Working papers	• No fixed requirement
5. Reporting (Report of findings and recommendations to the institution)	• Management Report • Updated RAS	• Annually • No fixed requirement
6. Follow-up of findings and recommendations.	• Updated RAS	• No fixed requirement

Source: OSFI, 1999.

In addition, CBRC should co-operate with other functional departments of the Chinese government to push the establishment of audit and accounting mechanisms, which could safeguard accuracy and validity of data from banks' customers.

5.3 Pillar 3: Some Thoughts

The CBRC recommends that Chinese banks should put sound information disclosure policies in place, including information-disclosing methods for choosing contents as well as relative internal controls to ensure the appropriateness of the

disclosure. In addition, Chinese banks should disclose all the important information related to capital adequacy ratio calculation so as to facilitate the assessment by market participants on the prudence of capital measurement, thus enhancing the effectiveness of market discipline (CBRC, 2007b).

From my understanding, Chinese banks also need to develop information systems to produce required breakdowns to aid information disclosure.

To successfully implement Basel II, it is critical for both CBRC and Chinese banks to cultivate and maintain professionals in their institutions. Because of the comprehensive contents of Basel II, the involvement of professional talents is of great importance with regard to the development and the use of an internal risk management system. Therefore, Chinese banks and CBRC should recruit professionals through multiple channels, reinforce feasible and appropriate staff trainings at different levels, provide the practitioners a better understanding of Basel II, and expand the application scope of internal risk management system.

In conclusion, being a crucial systematic project, Basel II implementation is technically complex and quite policy-oriented. Therefore, both the Chinese supervisor and bankers, particularly senior executives of banks, should have comprehensive understanding of the significance and implications of implementing Basel II and make joint efforts to be well prepared for Basel II implementation.

6 Conclusion

The implementation of Basel II is inevitable in the Chinese banking system. The Chinese banking regulator and the banks have made great efforts to accelerate Basel II implementation. Although they have made some progress, there remains a relatively large gap between the current status of Chinese banks and the implementation status required by Basel II.

Through an analysis of challenges faced by the Chinese banking system while implementing Basel II, I have made recommendations related to the IRB Approach to implementation and introduced a supervisory framework to the Chinese banking regulator.

In short, it is clear that the Chinese banking regulator and banks are walking steadily toward complete Basel II adoption and that the Chinese banking industry will ultimately achieve the integrated implementation.

Appendices

Appendix A: About Basel Committee on Banking Supervision

A. The Origin

BCBS was formed in response to the messy liquidation of a Frankfurt bank in 1974. On June 26, 1974, German regulators forced the troubled Bank Herstatt into liquidation. One bank had released payment of DEM[12] to Herstatt in Frankfurt in exchange for USD that delivered in New York. Because of time-zone differences, Herstatt ceased operations between the times of the respective payments. The counterparty bank did not receive its USD payments. This incident prompted the G-10 nations to form BCBS to deal with cross-jurisdictional issues at the end of 1974, under the support of the Bank of International Settlements.

B. The Objectives:

1) Define roles of regulators (supervisors of different countries) in cross-jurisdictional situations;

2) Ensure that international banks or bank holding companies operating in other countries do not escape comprehensive supervision by a home regulatory authority;

[12] The **Deutsche Mark (DEM, DM)** or German Mark was the official currency of West Germany and, from 1990 onwards, unified Germany.

3) Promote uniform capital requirements so banks from different countries may compete with one another on a level playing field (Glyn Holton, 2009).

C. Operation

BCBS does not possess any formal supranational supervisory authority, and its decisions do not have legal force. Rather, it formulates broad supervisory standards and guidelines and recommends statements of best practice in the expectation that individual authorities will take steps to implement them through detailed arrangements that are best suited to their own national systems, in either statutory form or otherwise (BCBS, 2009c). BCBS provides a forum for regular cooperation on banking supervisory matters and encourages contacts and cooperation between its members and other banking supervisory authorities. Contacts have been further strengthened by an International Conference of Banking Supervisors, which takes place every two years. BCBS circulates both published and unpublished papers to supervisors throughout the world, providing guidance on banking supervisory matters and promoting common understanding (BCBS, 2009c). BCBS secretariat is located at the Bank for International Settlements in Basel, Switzerland, and is staffed mainly by professional supervisors on temporary secondment from member institutions. In addition to undertaking the secretarial work for BCBS and its many expert sub-committees, it stands ready to give advice to supervisory authorities in all countries.

Appendix B: Timeline of the Basel Accords Issued by BCBS

Part 1: Basel I and Market Risk Amendment (BCBS, 2009a)

Time	Official Documents
March 1979	Basel Committee: Consolidated supervision of banks' international activities
March 1986	Basel Committee: The management of banks' off-balance-sheet exposures: a supervisory perspective
July 1988	Basel Committee: International convergence of capital measurement and capital standards (updated to April 1998); Basel Committee: Outcome of the consultative process on proposals for international convergence of capital measurement and capital standards.
November 1991	Amendment of the Basel capital accord in respect of the inclusion of general provisions/general loan-loss reserves in capital
April 1993	Basel Committee: Supervisory Recognition of Netting for Capital Adequacy Purposes
July 1994	Amendment to the Capital Accord of July 1988; Basel Capital Accord: the treatment of the credit risk associated with certain off-balance-sheet items
December 1994	Basel Committee: Amendment to the 1988 Capital Accord Recognition of Collateral
April 1995	Basel Capital Accord: treatment of potential exposure for off-balance-sheet items
January 1996	Overview of the amendment to the capital accord to incorporate market risks; Supervisory framework for the use of "back testing" in conjunction with the internal models approach to market risk capital requirements; Modifications to the market risk amendment; Amendment to the capital accord to incorporate market risks
April 1996	Interpretation of the capital accord for the multilateral netting of forward value foreign exchange transactions
April 1999	Capital requirements and bank behaviour: the impact of the Basel Accord
November 2005	Amendment to the capital accord to incorporate market risks

Part 2: Basel II new framework (BCBS, 2009b)

Time	Official Documents
July 1988	International convergence of capital measurement and capital standards
November 1999	Update on work on a New Capital Adequacy Framework
January 2001	Basel II: The New Basel Capital Accord - Second Consultative Paper (January 2001)
September 2001	Update on work on the New Basel Capital Accord
April 2003	Basel II: The New Basel Capital Accord - Third Consultative Paper
January 2004	Basel II: International Convergence of Capital Measurement and Capital Standards: a Revised Framework; Update on joint Basel Committee and International Organization of Securities Commission work on the prudential treatment of some trading book items
April 2005	Trading Book Survey: A Summary of Responses
November 2005	Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework
March 2006	Use of vendor products in the Basel II IRB framework
January 2006	Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version
September 2006	The IRB Use Test: Background and Implementation
October 2006	Risk weight for International Finance Facility for Immunization (IFFIm)
October 2007	Guidelines for Computing Capital for Incremental Default Risk in the Trading Book – consultative document
July 2008	Guidelines for Computing Capital for Incremental Risk in the Trading Book; Proposed revisions to the Basel II market risk framework.
January 2009	Revisions to the Basel II market risk framework; Guidelines for computing capital for incremental risk in the trading book; Proposed enhancements to the Basel II framework.
March 2009	Core principles for effective deposit insurance systems - consultative document

Appendix C: The Impact of Basel I

This section is mainly based on the "Capital Requirements and Bank Behaviour: The Impact of the Basel Accord" (A working group led by Patricia Jackson, 1999).

The impact and new problems are summarized as follows:

Table C-1: **Projected Goals and Unanticipated Results of Basel I**

Anticipated policy goals	Unanticipated result
Target 1. Growth of capital ratios for banks: 8% percent reserve target met or exceeded Minimum capital standard	Recognition that regulatory avoidance techniques could proliferate. Capital arbitrage increased and the use of securitization diluted the 8 percent minimum standard
Target 2. Creation of a level playing field for all international banks with a simple approach to credit risk	Implementation varied. Securitization techniques contributed to greater inequity, benefiting banks in some countries more than others do.
Target 3. Rein in off-balance-sheet exposure	Legitimized off-balance-sheet lending and introduced new risk elements

After the Accord was introduced in 1998, it became well recognized and enforced by both the member countries and some non-member countries, as well as becoming an accepted standard for supervising banking activities. Basel I had reshaped the global financial markets and accomplished the anticipated policy goals, though it also had encountered many unanticipated results.

Based on Table C-1, the following are the detailed analysis of the impact.

Target 1:

As expected, the accord did a great deal to improve the capital levels in international banks that had been too low. According to a recent analysis (A working group led by Patricia Jackson, 1999), since the introduction of the Basel Accord in 1988,

the risk-based capital ratios in developed economies have increased significantly with the industry's average capital ratio rising from 9.3% in 1988 to 11.2% in 1996. Although the data are not completely comparable across countries due to factors such as differing tax regimes, accounting standards, industrial and regulatory factors and cultural difference, it is clear that the introduction of the Basel capital adequacy ratios was followed by G-10 countries. Furthermore, the fact that the ratios set by banking supervisors are normally higher than the Basel minimum, which is 8%, was another important condition to further improve the low capital ratio. However, there also have been some less positive features accompanying these accomplishments. Over time, the banks have learned how to exploit the broad nature of the requirements, especially the limited relationship between actual risk (economic capital) and the regulatory capital charge. The unanticipated growth of regulatory capital arbitrage techniques, such as securitization and cherry-picking[13], and other not sufficiently recognized credit risk's mitigation techniques, such as collateral and guarantees, have diluted the 8% minimum requirement.

Regulatory capital arbitrage reflects banks' efforts to meet the required capital ratio and keep their funds' costs as low as possible. As the regulatory capital requirement has been in conflict with increasingly sophisticated internal measures of economic capital, banks have an incentive to use regulatory advantaged financial innovations to meet the capital requirement. Obviously, banks can increase capital ratios either by increasing the numerator (the level of regulatory capital) or by decreasing the denominator (total risk-weighted assets). Risk weighted assets can be decreased through a reduction in assets or

[13] Within a particular risk-weight category, such as 100% risk-weighted assets, cherry-picking is the practice of shifting the portfolio's composition toward lower quality credits. For example, in order to boost its return on equity, a bank may decide to originate fewer BBB-rated loans in favour of more BB-rated loans. In this case, the bank's total risk weighted assets and regulatory capital ratios would appear unchanged, even as its overall riskiness increased.

through a switch from higher to lower weighted assets and/ or capital arbitrage practices. Securitization is an example of these innovations, a by-product of the Accord that grew explosively since 1988. In March 1998, outstanding non-mortgage securitizations by the ten largest US bank holding companies amounted to around $200 billion, more than 25%, on average, of these banks' risk-weighted loans. European banks have also been using the US markets for securitizations and there is also evidence that securitizations performed outside the US have been growing rapidly. Overall, therefore, with the increasing sophistication of the banks and the development of new innovative techniques in the market, the largest banks have started to find ways of avoiding the limitation which fixed capital requirements place on their risk-taking relative to their capital. For certain banks, this is undoubtedly starting to undermine the comparability and even the meaningfulness of the capital ratios maintained.

Target 2:

Although the Accord made an effort to create a level playing field for all international banks with a simple approach to credit risk and the 8% requirement of capital ratio, there were still large inequities due to different costs of capital, the accounting principles used, and other policies. Because the capital requirements are applied uniformly across a broad class of assets, banks have an incentive to substitute towards the riskier assets in the class ("Cherry-Picking"), leading to an overall rise in the riskiness of the banks' assets. For example, as the risk weight for all corporate loans is 100%, banks would like to own riskier corporate loans to gain more profit while keeping the risk weighted asset same. These are the principal reasons why the BCBS decided to propose a more risk-sensitive framework in June 1999. The degree of utilization of

cherry-picking technique among banks will create inequality among these banks. For example, as a "Special Purpose Vehicle" sells asset-backed securities to investors who are normally insured by banks with the high quality assets (loans), securitization techniques have given banks an incentive to move high quality assets off the balance sheet, thus reducing the average quality of bank loan portfolios. Variations in implementation of securitization by different countries added to additional inequities among banks, which benefited banks in some countries more than others.

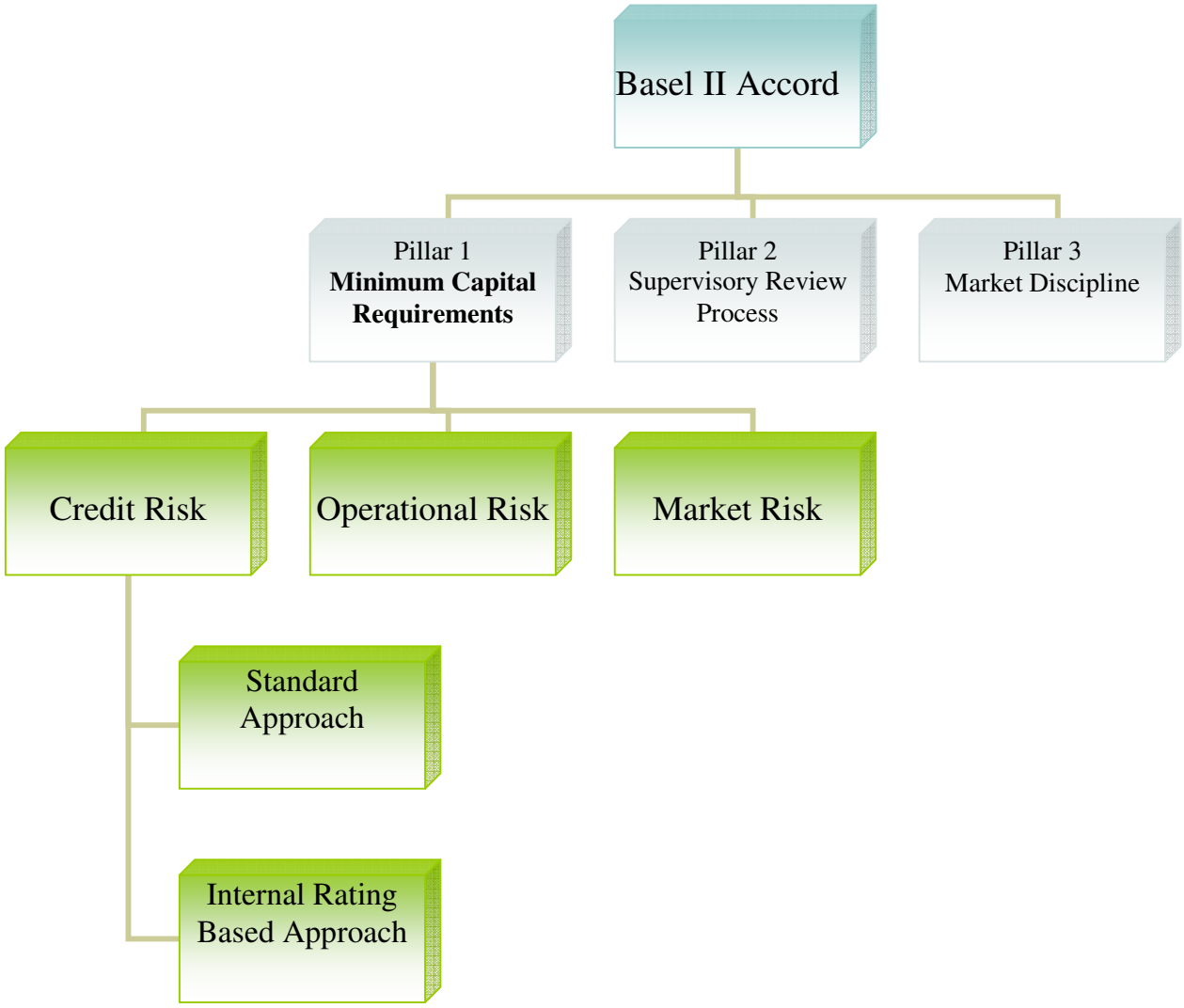
Target 3:

The Accord's greatest success was to rein in bank transactions that may not have been recorded on a balance sheet, such as derivatives and foreign exchange exposure. However, a policy promulgated to rein in off-balance-sheet bank lending created a regulatory environment ripe for new forms of this type of financing to flourish, such as securitizations.

As a result, the 1988 Accord has led to two outcomes. One anticipated outcome is the growth of capital ratios and greater global financial stability. An unanticipated development is the growth of off-balance-sheet funding through securitization. Securitization transferred risk outside the traditional banking system, which is often viewed as a positive development. However, it also diluted the 8% capital requirement.

In addition, Basel I only considered credit risk, rather than the increasing market risk and operation risk. Moreover, the risk weight for credit risk is too simple, which is arbitraged by banks through Cherry-Picking. Finally, Basel I did not consider market discipline and supervisory review.

Appendix D: Main Structure of Basel II



Appendix E: Detailed Explanation of Basel II

A. The First Pillar: Minimum Capital Requirements

Pillar 1, the minimum capital requirement for banks, can be expressed as:

$$\frac{\text{capital}}{\text{credit risk} + \text{market risk} + \text{operational risk}} \geq 8\%$$

Basel II calculates the capital requirement based on credit risk, market risk and operational risk, while Basel I is based on credit risk alone. Although Basel II maintains both the definition of capital and the minimum requirement at 8% of capital to risk weighted assets in Basel I, it makes a great improvement in measuring risks of assets. Basel II offers more complicated measurement methods for credit risk, proposes a measure for operational risk for the first time, and proposes the market risk measure that was first considered in 1996. Furthermore, banks have different options to calculate each risk based on their capability of risk management. (Refer to Appendix F)

(a) Credit Risk

To measure the credit risk, there are two main options, the Standard Approach, and the IRB Approach that includes foundation and advanced IRB. The use of the IRB Approach will be subject to approval by the supervisor, based on the standards set by the Basel committee.

Option 1: Standardized Approach

Although the Standardized Approach is the same as the present Accord from a conceptual point of view, it is more risk sensitive. Basel II allocates a risk-weight to each

of its assets and off-balance-sheet positions, while Basel I appoints a risk weight based on the broad category of borrower (i.e. sovereigns, banks or corporate). Under Basel II, the risk weights are defined by reference to a rating that is provided by an external credit rating agency, such as Dun & Bradstreet, Standard & Poor's and Moody's. For example, for corporate lending, Basel I provides only one risk weight category of 100% but Basel II will provide four categories (20%, 50%, 100% and 150%). The risk weight of the OECD countries is also differentiated in Basel II, while they have the same weight in Basel I.

For example, a bank has two types of assets that have low ratings, $500 below BB- company bond (asset 1) and $500 Turkey government bond (asset 2). The total capital of this bank is at $40.

Under Basel I, risk weighted assets= (asset 1* risk weight) + (asset 2* risk weight) = $500*100%+$500*0%=$500, while, under Basel II, risk weighted assets = (asset 1* risk weight) + (asset 2* risk weight) = $500*150%+$500*100%=$1250. (Risk weight refer to Appendix G and H) Therefore, capital ratio under Basel I = (capital/risk weighted assets)=$40/$500=8%, while, capital ratio under Basel II=$40/$1250=3.2% Conversely, a bank has two types of assets that have high ratings, $500 AA- company bond (asset 1') and $500 Germany government bond (asset 2'). Under Basle I, the risk weighted asset=$500*100%+$500*0%=$500, while, under Basel II, the risk weighted asset=$500*20%=$100. Therefore, capital ratio under Basel I = (capital/risk weighted assets)=$40/$500=8%, while, capital ratio under Basel II=$40/$100=40%.

In conclusion, Basel II is more risk sensitive. Under Basel II, banks with assets from low rated companies and countries will be worse off, while banks with assets from

high rated companies and countries will be better off. The consequence is that banks would like to lend money to these companies and countries that have high rating.

Option 2: IRB Approach

Four quantitative inputs and their differences of foundation and advanced IRB Approaches have been mentioned in Chapter 2.2.3.

Utilizing the IRB Approach, banks will be permitted to use their internal estimates of borrower creditworthiness to assess credit risk in their portfolios, subject to strict methodological and disclosure standards. A bank estimates each borrower's creditworthiness, and the results are translated into estimates of potential future losses, which form the basis of minimum capital requirements. The framework allows for both the IRB method and advanced IRB methodologies for corporate, sovereign and bank exposures. Different types of loan exposures will have different distinct analytical frameworks. For example, the loss characteristics of corporate and retail lending are different. Under both the basic and advanced IRB Approaches, the range of risk weights will be far more diverse than that in the standardized approach, resulting in greater risk sensitivity.

Option 3: Securitization Framework

Off-balance sheet lending and securitization are two main issues in Basel II. It introduces more risk sensitive approaches to the treatment of collateral, guarantees, credit derivatives, netting and securitization, under both the Standardized Approach and the IRB Approach.

(b) Operational Risk

BCBS also has been making efforts to develop an appropriate capital charge for operational risk, such as the risk of loss from computer failures, poor documentation or fraud. BCBS expects operational risk to constitute approximately 20% of the overall capital requirements under the new framework on average. Many major banks now allocate 20% or more of their internal capital to operational risk. It will be important to collect sufficient loss data in the coming months to establish accurate calibration of the operational risk.

There are also three approaches to measure operational risk, a basic indicator approach, a standardized approach, and an internal measurement approach. The basic indicator approach and standardized approach mainly calculate the capital charge for operation risk based on the standard set by Basel II. These two approaches require banks to charge roughly 20% of the total capital to cover their operation risk. The internal measurement approach, which is subject to satisfying minimum supervisory standards, is generated by the banks' own operational risk measurement systems.

BCBS's ultimate goal is to ensure that the regulatory capital requirement is sufficient to address underlying risks and contains incentives for banks to migrate from the foundation approach to the IRB Approach.

(c) Market Risk

Although the overall capital requirement set by Basel I was intended to cover all risks, it set a capital requirement only in terms of credit risk. In 1996, market risk exposures were removed from the credit risk category and were given separate capital

charges. There are two approaches to measure market risk, a Standardized Approach and internal models approach. The Standardized Approach calculates risk based on the standard set by BCBS for each of equity risk (stock price change), interest risk (interest rate change), currency risk (foreign exchange rate change) and commodity risk (product price change), and then adds them together to get the total capital charge for market risk. The internal models approach calculates the total capital charge based on banks' own measurement system, which is subject to satisfying minimum supervisory standards.

B. The Second Pillar: Supervisory Review Process

The supervisory review process requires supervisors to make sure that each bank has a sound internal rating system in place to assess the capital adequacy based on a comprehensive evaluation of its risks. Basel II stresses the importance of bank management by developing an internal capital assessment process and setting targets for capital that are appropriate with the bank's particular risk profile and control environment. Supervisors would be responsible for evaluating how well banks are assessing their capital adequacy needs relative to their risks. This internal process would then be subject to supervisory review and intervention.

The implementation of this review process will require much more detailed communications between supervisors and banks. This in turn has implications for the training and expertise of supervisors and banks.

C. The Third Pillar: Market Discipline

Market discipline aims to enhance disclosure by banks. Effective disclosure is essential to ensure that market participants can better understand banks' risk profiles and

the position of capital adequacy. Basel II sets out disclosure requirements and recommendations in several areas, including the way a bank calculates its capital adequacy, its risk assessment methods, and its scope of disclosure. The core set of disclosure recommendations focus on more detailed requirements for supervisory recognition of internal methodologies for credit risk, credit risk mitigation techniques and asset securitization.

Appendix F: Risk Approaches of Basel II

Risk Approaches	Explanations
(I) Credit Risk	
A Standardized Approach (a modified version of the existing approach)	Changes from Basel I, use of external credit ratings to determine risk weights, more risk differentiation to solve the cherry-picking problem, more recognition of credit risk mitigate technique to solve securitization issue.
A Foundation Internal Rating-Based Approach (IRB Approach)	Use of internal measurement to determine risk weights
An Advanced IRB Approach	Use PD, LGD, EAD, and M to determine the total capital the bank needs
(II) Market Risk	
A Standardized Approach	Based on Equity risk, Interest rate risk, Currency risk and Commodity risk.
An Internal Models Approach	Prefer the Value at risk (VaR)
(III) Operational Risk (roughly 20% of the total capital)	
A Basic Indicator Approach	Only one indicator, 15 percent of Gross income
A Standardized Approach	Several indicators, different percentages 12-18% apply to 8 different business segments (e.g., 15% of gross income in commercial banking segment)
An Internal Measurement Approach	Generated by bank's own operational risk measurement systems (subject to satisfying minimum supervisory standards)

Appendix G: Treatment to Company Claims

Credit Rating	AAA to AA-	A+ to A-	BBB+ to BB-	Below BB-	Unrated
Basel I risk weight	100%	100%	100%	100%	100%
Basel II risk weight	20%	50%	100%	150%	100%

Appendix H: Treatment of OECD Country

OECD Country	Sovereign Rating	BASEL I (risk weight)	BASEL II (risk weight)
Turkey	B-	0%	100%
Mexico	BBB+	0%	50%
Korea	A	0%	20%
Germany	AAA	0%	0%

Appendix I: Structure of the Chinese Banking System

Chinese Banking System		
Central Bank	People's Bank of China	
Regulatory Institutions (3)	China Banking Regulatory Commission	
	China Securities Regulatory Commission	
	China Insurance Regulatory Commission	
Policy Banks (3)	Agricultural Development Bank of China	
	National Development Bank	
	China Import and Export Bank	
State-owned Commercial Banks (5)	Industrial and Commercial Bank of China	
	Bank of China	
	China Construction Bank	
	Agricultural Bank of China	
	Bank of Communications	
Joint Stock Commercial Banks (12)	China Merchants Bank	CITIC Industrial Bank
	Shanghai Pudong Development Bank	Guangdong Development Bank
	Industrial Bank	Huaxia Bank
	China Minsheng Banking Co.	Shenzhen Development Bank
	Everbright Bank of China	Evergrowing Bank
	China Zheshang Bank	China Bohai Bank
City Commercial Banks (112)		
Rural Commercial Banks	**Foreign Banks**	
Urban Credit Cooperatives	**Postal Savings**	
Rural Credit Cooperatives	**Non-bank Financial Institutions**	

Appendix J: Requirements to Implement Basel II

Pillar 1: Capital Adequacy	Main Features	Key Requirements
Credit Risk 1 Simplified Standardized Approach (SSA)	Greater risk sensitivity than Basel I through more risk buckets and risk weights for sovereigns and banks based on Export Credit Agency (ECA) risk scores. Operational risk charge 15 percent of annual gross income. Pillar 2 and 3 are applicable.	
Credit Risk 2 Standardized Approach (SA)	More risk buckets than SSA. Risk weights for asset classes based on ratings of external credit assessment agencies (ECAIs) or ECA scores. Enhanced credit risk mitigation is available.	Ratings of ECAIs. Ability and capacity to qualify rating agencies and map agency scores
Credit Risk 3 Foundation Internal Ratings Based Approach (F-IRB)	Risk components: probability of default (PD), loss given default (LGD), exposure at default (EAD), and maturity (M). Banks can use own PD estimates and supervisory estimates for other components. Stress testing required.	Ability to assess banks' rating system design. Ability to validate banks' risk management and stress testing systems. Ability to provide supervisory estimates of LGD and EAD
Credit Risk 4 Advanced Internal Ratings Based Approach (A-IRB)	Capital requirements determined as in F-IRB Banks can use own estimates for PD, LGD, EAD and M. Subject to supervisory validation of systems. Stress testing required.	Ability to assess banks' rating system design. Ability to validate banks' risk management and stress testing systems.
Operational Risk 1 Basic Indicator Approach	Flat rate is 15 percent of gross annual income.	
Operational Risk 2 Standardized Approach	Operational risk charges for each business line, based on annual income per business line, multiplied by risk factor per business line.	System to distinguish business lines and supervisory ability for validation of this system.

		Data on operational risk occurrences and costs.
Operational Risk 3 Advanced Measurement Approach	Full reliance on banks' internal risk measurement systems, subject to supervisory approval.	Capacity for supervisory validation.
Pillar 2: Supervisory Review	**Main Features**	**Key Requirements**
	Banks have a process for assessing capital adequacy (CAAP) and a strategy for maintaining capital level. Supervisors evaluate banks' internal capital adequacy systems and compliance. Higher capital adequacy levels for individual banks if risk profile requires. Early intervention is by supervisors. Stress tests and Assessment of interest rate risk and concentration risk.	Supervisory ability and capacity to make the necessary assessments. Adequate legal and regulatory framework to take action.
Pillar 3: Market discipline	**Main Features**	**Key Requirements**
	Information to be disclosed includes Available capital in the group, capital structure, detailed capital requirements for credit risk: • Breakdown of asset classification and provisioning • Breakdown of portfolios according to risk buckets and risk components • Credit risk mitigation (CRM) methods and exposure covered by CRM Operational risk and market risk are applicable.	Banks' information systems to produce required breakdowns; Accounting and auditing systems that safeguard accuracy of disclosures. Ability to require disclosure, monitor and verify.

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