The Development and Prospect of Operational Risk Measurement in China's Commercial Banks

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ABSTRACT

With the development of various businesses of commercial banks in China, operational risk has become one of the main risks faced by commercial banks. Meanwhile, the international management methods for operational risk of commercial banks include Basic Indicator Approach, Standardized Approach, Advanced Measurement Approach, and the latest standard measurement Approach of Basel Association. Although many metrics have been produced internationally to control the operational risk of commercial banks, the operational risk management of commercial banks in China is still relatively backward. By comparing the development of China's operational risk management with the international advanced level, it can be found that China's operational risk management still has the problems of insufficient awareness of operational risk hazards, backward operational risk management mechanism and insufficient risk loss data, etc. China's commercial banks should raise the awareness of operational risk as soon as possible, update the metrics for controlling operational risk and establish in this regard China's commercial banks should raise the awareness of operational risk as soon as possible and update the measurement methods for controlling operational risks and establish their own risk data to improve operational risk management.

Keywords: Operational risk, Risk measurement, Regulatory reform, Commercial banks.

1. INTRODUCTION

Since entering the 21st century, China's reform of the capital market has gradually deepened. China's commercial banks mainly engaged in deposit and loan business gradually turned to a variety of financial services from the past. In this process, the importance of risk management of commercial banks has become increasingly prominent. Commercial banks' three main risks are interest rate risk, credit risk, and operational risk. Interest rate risk and credit risk have perfect measurement and control models, while the operational risk is difficult to measure effectively due to its particularity. In the process of risk management of Chinese commercial banks, it is often ignored by people. In recent financial development, operational risk often brings enormous losses. It is essential to explore international advanced operational risk measurement methods.

2. A REVIEW OF RESEARCH IN CHINA AND FOREIGN COUNTRIES

There are three methods to measure operational risk capital in China and foreign countries: The Basic Indicator Approach (BIA), Standardized Approach (SA), and Advanced Measurement Approach (AMA).

2.1 The Basic Indicator Approach (BIA)

The basic indicator approach (BIA) uses commercial banks' total income as a risk indicator to measure the operational risk of banks. This indicator's principle of determining operational risk capital is to multiply the average value of positive total income of the first three years by a fixed proportion. At present, the fixed proportion value set by Basel Committee is 15%.

$$K_{BIA} = \left(\frac{GI_1 + GI_2 + GI_3}{3} \right) \times \alpha \quad (0\text{-}1)$$

$GI = total\ income$

$\alpha = 15\%$

The basic indicator approach (BIA) has the advantages of easy calculation and low cost. This method indirectly measures the overall operational risk of a commercial bank based on the total income, assuming that the higher the bank's income, the higher the operational risk. However, in real life, this is not reasonable. Higher-income does not mean that there is a higher operational risk. If this approach is followed, high-income banks will maintain high operational risk reserves, even if they do not need many capital reserves. At the same time, all of the bank's operations are considered as a whole. However, in modern commercial banks' operation process, a wide range of businesses are involved, and the corresponding operational risks of each business line are different. It is too simple to regard the operational risk of each line as the same. It cannot play a useful role in monitoring the operational risk of commercial banks.

2.2 Standardized Approach (SA)

The standardized approach (SA) is still based on commercial banks' total income as a measure of operational risk capital of commercial banks. The difference is that he subdivided various business lines of commercial banks into eight different business lines and formulated a risk coefficient value for the corresponding operational risk of each business line. The specific risk coefficient table is shown in "Table 1". The operational risk reserve of commercial banks is the sum of the product of the eight business lines and the risk coefficient.

Table 1. Beta coefficient of each business line of commercial banks

Product line	Beta coefficient
Corporate finance	18%
Trading and sales	18%
Retail banking	12%
Commercial Banking	15%
Payment and settlement	18%
Agency services	15%
asset management	12%

$$K_{SA} = \frac{\Sigma_{year1-3}\ \max\left[\Sigma\left(GI_{1-8} \times \beta_{1-8}\right), 0\right]}{3} \quad (0\text{-}2)$$

Compared with the primary index method, the standard method further subdivides the risk coefficient of different business lines in commercial banks, evaluating commercial banks' operational risk more reasonably. However, it has not yet revealed the causes of operational risk, and it is still challenging to play its valuable role in the complicated business classification of China's commercial banks. Simultaneously, the standard method and the basic index method are also based on the total income to measure the operational risk capital of commercial banks. There is still an unreasonable problem that "the higher the total income, the greater the operational risk" in principle.

2.3 Advanced Measurement Approach(AMA)

The measurement of operational risk reserve capital under the advanced measurement approach (AMA) requires banks' internal operational risk measurement system to use both quantitative and qualitative indicators. Under the advanced measurement method, the bank's operational risk reserve capital should be equal to 99.9% of the difference between the unexpected loss and the expected loss.

According to the frequency of risk events and the loss's size, Risk events can be classified as risk events can be classified as high frequency and low loss, low loss and high frequency, high frequency and high loss, low loss and low frequency. For high frequency and low loss risk events, poisson distribution is generally used for modelling. The lognormal distribution is generally used to model the loss for low frequency and high loss risk events.

By using Monte Carlo simulation, combined with the distribution image of low-frequency high loss and high-frequency low loss, to get the probability distribution map of a total loss. Accordingly, previous risk data can be used to determine the frequency and severity of losses in order to estimate total losses. The specific fitting process is shown in "Figure 1".

Although the advanced measurement method can scientifically calculate the operational risk reserve of commercial banks based on the previous data, the biggest problem is data acquisition. If sufficient data are not available, a reasonable loss level and loss frequency model cannot be built either. Therefore, it is impossible to correctly estimate the capital reserve of commercial banks' operational risk.

Table 2. Recommended coefficients of each interval under the new standard method

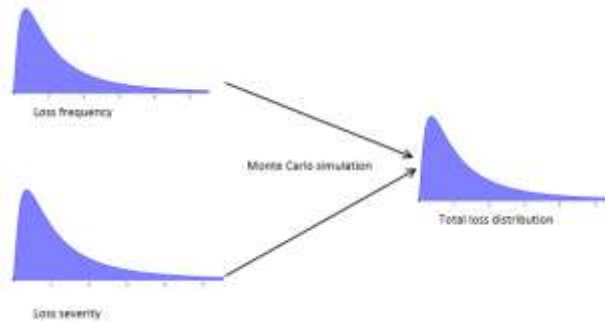| BI (Million euro)	coefficient
0~100	10%
100~1000	13%
1000~3000	17%
3000~30000	22%
>30000	30%

Figure 1 The formation process of total loss distribution.

3. BASEL III STANDARD MEASUREMENT APPROACH (SMA)

After the 2008 global financial crisis, the Basel Association re-examined the previous risk management system and concluded that: since the financial crisis, the number and scale of global operational risk events have been rising; the capital reserve of operational risk has not changed. Under the standard method, GI (total income) is used to measure the operational risk of commercial banks, but the total income is not related to the operational risk. So far, people doubt whether the simple method can accurately measure the operational risk of commercial banks

The Basel Committee announced in March 2016 that it intends to use a new risk measurement method to measure the demand for operational risk capital to replace the three measurement methods proposed in Basel II, which is the standard measurement method SMA. The standard measurement method first defines a new scalar: business index (BI), which is used to replace the total income GI. Bi is based on the bank's three macro components, namely interest component, services component, and financial component. The interest component is the absolute value of interest income of commercial banks; the service component includes the net income of handling charges and other operating income; the financial component includes the net profit and loss of transaction accounts and bank accounts. Comparing Bi with the GI coefficient, the obvious difference is that the part of the business that Bi focuses on is closer to operational risk and more reasonable. It includes many core issues that the total income index ignores. After obtaining Bi, The amount of operational risk capital required by commercial banks can be estimated by multiplying it by a fixed factor, which is given by the Basel Institute as shown in the "Table 2". The introduction of the standard measurement method has improved the unreasonable practice of judging commercial banks' operational risk by the total income of commercial banks in the past. The standard measurement method provides a new way for commercial banks

to collect useful risk data and use advanced measurement methods. At the same time, it also avoids the significant shortcomings of the previous primary index method and standard method. In the short term, it can be used as a new method of operational risk management of domestic, commercial banks to try. Make those small commercial banks improve the level of operational risk management further. The overall risk level of China's banking industry is further reduced, and the development of the financial industry is more stable and healthy.

4. THE BASIC SITUATION OF OPERATIONAL RISK MANAGEMENT IN CHINA'S COMMERCIAL BANKS

Compared with the developed countries such as Britain and the United States, there is still a considerable gap between theory and practice. Although the guidelines on operational risk management of commercial banks formulated by China banking regulatory commission (CBRC) provide some help for commercial banks' operational risk management, compared with Basel Accord, it is still a lack of standardization and institutionalization. China's current risk management is still based on qualitative, but Europe and the United States, and other developed countries have developed quantitative risk management steps. 2021 is the first year of the 14th five-year plan. China is still trying to deepen its financial reform and gradually open up its capital account convertibility and RMB internationalization. However, in recent years, the international economic environment is volatile. This requires China's commercial banks to improve their risk management level, especially the weak operational risk management. After several years of development and improvement, there are still some main problems as follows:

- Commercial banks lack of correct understanding of operational risk hazards and prevention methods, credit risk and market risk in commercial banks has a particular risk control department to manage. However, the operational risk is directly related to each employee in commercial banks. Management is more difficult, and each employee's awareness of operational risk is relatively weak. For grassroots employees, it is generally believed that risk management has nothing to do with themselves. For senior managers,

the relatively weak operational risk awareness may make them make wrong business decisions. Once work mistakes cause operational risk events, they will cause more serious consequences.

- The operational risk management mechanism is backward. The operational risk management of China's commercial banks is still lagging. Most of China's domestic, commercial banks have not yet met Basel III's requirements, adopting more scientific and reliable advanced measurement methods, and still adopting the most basic index method. Such a method can not meet the needs of today's operational risk timely, effective, and reliable monitoring, resulting in the weakening of the bank's internal control, making operational risk events more likely to occur.

- Lack of a useful operational risk loss database and risk loss data has always been an essential part of risk management. Because risk management analyzes the historical risk event data to improve future risk management and put forward more effective management methods, there is still no more authoritative and reliable risk data provider in China. Risk data must be accumulated independently by each country according to its development situation, and it can not use other countries' data. Because each country's policy and management system are different. Suppose there is no reliable and available extensive historical data. In that case, it is impossible to establish a suitable risk management model for national commercial banks, and it is impossible to achieve reliable prevention and control of operational risk events with high frequency and low loss.

5. THE PREVENTION STRATEGY OF OPERATIONAL RISK OF CHINA'S COMMERCIAL BANKS

The above-mentioned problems of current operational risk management in China can be improved by adopting the following approaches.

- Although operational risk does not appear as often as credit risk and interest rate risk, it is still an indispensable part of modern commercial banks' stable operation. If operational risk management is neglected, in the event of an operational risk event, it will have severe consequences, ranging from heavy losses to bankruptcies. Operational risk must be promoted to the

same important position as credit risk and interest rate risk, and the importance of operational risk management should be transferred to every grassroots staff in their daily work to enhance the awareness of every staff member.

- Risk management is a continually changing industry. Only timely learning international advances risk management knowledge. It can make their risk management level keep up with the development of the times. Therefore, it is all the more important to update the obsolete risk management model and gradually move to a higher level of risk management approach in the actual risk management work. So the risk management in the business process is more efficient and more quality.

- In the course of its operations, it should pay attention to the collection and collation of various data in the course of the bank's operations. Only in this way can the operational risk of commercial banks be accurately quantified and modelled in order to estimate and prevent the overall level of operational risk of the bank. At the same time, data acquisition is also important. Only historical risk data from different business departments and different directions have value, making the risk model's establishment and prediction more quality and reliable.

6. CONCLUSION

The operational risk capital measurement of commercial banks is a very complex process, and the following measurement methods have been gradually formed internationally after a long period of development: the basic indicator method, the standard method, the advanced measurement method, and the new standard measurement method proposed by the Basel Association in 2016. In contrast, China's domestic operational risk measurement is still at a relatively backward stage. It should be more clearly understood that China does not pay enough attention to operational management, risk data accumulation is insufficient and measurement methods are still relatively backward. This paper summarises and compares advanced international approaches to operational risk management, from which it can be seen that China should pay attention to operational risk management in its future development, while building our own risk database and gradually working towards more advanced risk management models used. At the same time, operational risk

management should be different in each country due to the different economic conditions and policy regimes, and the above conclusions are drawn only from the perspective of quantitative methods of risk management and are not comprehensive. The operational risk management of commercial banks in each country should still be carried out in accordance with the actual situation of the country, and there are no uniform implementation norms.

AUTHORS' CONTRIBUTIONS

This paper is independently completed by Kailin Feng.

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