

# Risk Analysis and Preventive Measures for Credit Card Business of Commercial Banks

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**Abstract.** In recent years, China's credit card business has developed rapidly and gradually become a new development highlight for domestic commercial banks. However, with the development of credit card business, the risk frequency of credit card business has also increased. How to fully and effectively learn from advanced foreign experience and establish a risk management system suitable for China's actual situation is of great practical significance for resolving the risks of credit card business in commercial banks in China. This article first introduces the types of credit card products and the characteristics of credit card business in Chinese commercial banks. Starting from the current development status of credit card business in Chinese commercial banks, it analyzes the risks existing in China's credit card business, draws on the experience and training of credit card business risk management in the United States and South Korea, and proposes risk prevention measures for credit card business in Chinese commercial banks.

**Keywords:** Credit Card; Risk; Countermeasure.

## 1. Introduction

In recent years, China's bank card business, especially credit card business, has developed rapidly. Since the first credit card was launched by Bank of China in 1985, the credit card business in China has developed rapidly and has become a major business of banks. As of the end of 2010, a total of 2.415 billion bank cards were issued nationwide, a year-on-year increase of 16.9%, and the growth rate accelerated by 2.2 percentage points compared to the same period last year. Among them, the number of credit cards issued was 229 million, with a year-on-year growth rate of 23.7%, accounting for 9.48% of the total number of bank cards issued, up from 8.98% at the end of the previous year.

The gradual improvement of the domestic credit system has led consumers to gradually identify with cardholder consumption, which plays an important role in the daily lives of Chinese residents. With the development of credit card business, the number of credit cards continues to grow, and the risk frequency of credit card business also increases accordingly. How to fully and effectively learn from advanced foreign experience and establish a risk management system suitable for China's actual situation is of great practical significance for resolving the risks of credit card business in commercial banks in China.

This article first elaborates on the product types and business characteristics of credit cards, deeply analyzes the current development status of China's credit card business, and analyzes the risks of domestic credit card business. By using comparative analysis methods and combining the successful experience and practices of advanced credit card risk management in the United States, this paper reflects on the lessons learned from the failure of credit card risk management in South Korea, and proposes strategies and suggestions for improving risk management in domestic credit card business.

## 2. Literature Review

Research status abroad: Stightz and Weiss (1981) proposed a theory on how the party with a relative advantage in information acts in the market [1]. In the credit card credit market, the information between borrowers and banks is asymmetric, which can easily lead to "moral" risks.

Elizabeth Langwith (2005) pointed out that high repayment rates are a partial cause of credit risk [2]. Through investigating a large number of credit card users, in order to reduce credit card risk, issuing



banks should appropriately reduce repayment rates, control internal operational risks, and assist professional debt collection companies in handling bad debts.

In the book "Advanced Credit Risk Analysis" by Cossin Didier and Pirotte Hugues (2005), a large number of latest modeling techniques related to credit risk pricing and management are presented, and their various applications in practice are explored [3].

For the credit card industry, foreign research mainly uses microeconomics and statistical methods to theoretically analyze the generation, identification, and prevention of risks, and establishes mathematical models to predict and measure risks using mathematical methods.

Research status in China: Wei Peng (2007) believes that the risks of credit card business have concealment, lag, dispersion, and complexity [4]. Currently, there are deficiencies in control methods such as identification and measurement in bank risk management; Lack of a scientific credit card account management platform; The calculation method of credit card overdraft interest and late fee is not scientific; Lack of a market-oriented response mechanism for credit card overdraft interest rates. Proposed: improving risk policies and regulations; Scientifically strengthen the quality management of overdraft assets; Suggestions for actively expanding channels for disposing of non-performing assets and creating a more relaxed policy environment for the development of credit card business.

Yan Tianbing and Shen Li (2007) believe that credit card business is a business that emphasizes both high returns and high risks [5]. In the article "Research on Credit Risk Management of Credit Cards in China", the profit structure of credit cards is first analyzed, and then credit risk issues are identified and measured using credit scoring models to obtain customers, Propose effective credit card credit risk management methods from three aspects: managing existing customers and collecting arrears.

Wu Di and Jiang Peng (2008) introduced in "On Credit Card Risk Management of Commercial Banks in China" that merchants, cardholders, commercial banks, and third parties are the sources of credit card fraud risk, analyzed the manifestations and causes of fraud risk, and proposed measures to strengthen credit card risk management [6].

Wang Yiming and Li Peng (2008) pointed out that there is currently no mature measurement method for operational risk, especially internationally recognized methods [7]. Domestic commercial banks can start with basic work and gradually establish and improve operational risk management processes by using data models to improve risk measurement levels.

### 3. Types and Business Characteristics of Credit Card Products in Commercial Banks

#### 3.1. Product Types of Credit Cards

**Table 1.** Example of bank card products

Name		cannot be overdrawn	for small overdraft	credit loans	for domestic use	overseas use
Quasi credit card			√		√	
Credit Card	RMB Credit Card			√	√	
	International Card			√	√	√
Debit Card	RMB Debit Card	√			√	
	International Debit Card	√			√	√

With the development of banking business, the use of bank cards is increasing, and their types are also constantly increasing. Bank cards are mainly divided into three categories: debit cards, quasi

credit cards, and credit cards, among which quasi credit cards and credit cards are referred to as credit cards. The difference between credit cards, quasi credit cards, and debit cards is that credit card holders do not need to deposit in advance in their accounts to overdraw and consume. Afterwards, they can repay according to bank regulations and enjoy a certain period of interest free period. A debit card is a savings card that needs to be deposited before consumption, and cannot be overdrawn. A quasi-credit card is a credit card that allows for conditional and limited overdraft consumption through a certain guarantee or deposit in an imperfect social integrity system. Table 1 lists the main bank card products of the bank.

### **3.2. Characteristics of Credit Card Business**

Credit card is a credit payment tool with overdraft function. Essentially, it is a credit product and a small, revolving, credit free consumer credit business. The nature of credit card business determines its essential differences from debit card business in terms of profit model, risk control, and business processing.

#### **3.2.1. High Investment**

The main investment projects for credit card business include: the cost of constructing a credit card business processing system and developing and constructing related projects; The cost of raising credit funds to provide overdraft consumption; Operating and management expenses, including marketing and promotional expenses, account for a significant proportion of the overall investment in credit card business; Write-off expenses for bad debts, etc. The high investment in credit cards is mainly manifested in the initial one-time fixed investment, continuous annual investment in marketing, publicity, and promotion expenses, as well as operational expenses. In general, the continuous investment in the previous years has not yet produced corresponding output.

#### **3.2.2. High Risk**

Any credit loan business has risk characteristics, and credit card business cannot be avoided, and the collection cost of credit card small loans is higher. Credit card is a credit business that uses customer personal credit as a guarantee for loans [8]. It is a type of credit without guarantee, which makes credit card business favored by cardholders. However, for card issuing banks, it increases business risks, and it is inevitable that some customers may maliciously overdraw and cause losses to the bank.

#### **3.2.3. High Yield**

Credit card business is recognized by the international financial industry as one of the most profitable businesses, with its main sources of income being annual fee income, loan interest income, merchant transaction fee income, etc. Credit card business belongs to the asset business of issuing banks, providing consumer credit to cardholders. Its main source of income is to obtain high overdraft loan interest income and other intermediary business income by providing consumer loans to customers, rather than relying on deposits in the card to obtain interest margin income.

#### **3.2.4. Strong Dependence on Publicity, Marketing, and Promotion**

The group with strong consumption is the customer group of credit card business. Proactively attacking and tapping into potential customers is the marketing method for credit cards. Customers' enthusiasm for credit card consumption, overdraft consumption, and the use of revolving credit can be achieved through long-term, sustained, and effective marketing. Individual customers have impulsive and emotional characteristics, and are easily influenced by advertising and promotion. Through innovative promotional and marketing activities, they can stimulate cardholders' enthusiasm for credit card consumption, reflect the characteristics of each bank, and attract cardholders' attention. Therefore, when starting a credit card business, it is necessary to establish a brand image, and marketing and promotion work plays an irreplaceable role in improving customers' willingness and loyalty to use cards [9].

### **3.2.5. Strong Dependence on Information Technology Support**

The credit card business process is complex, involving multiple system modules such as card application, credit review, card issuance, authorization, clearing, and collection. The effective coordination and operation of various businesses and links, as well as the improvement of efficiency, rely on advanced information technology and a fully functional credit card business processing system. A comprehensive credit card business processing system can also reduce errors, save a lot of labor costs, and monitor and prevent risks in all aspects of credit card business. It can be seen that the credit card business relies heavily on internal and external information technology support.

### **3.2.6. Less Dependence on the Number of Institutional Branches**

More than 95% of credit card transactions (such as merchant consumption, ATM withdrawals, and telephone banking inquiries) occur outside the bank's branch offices. Therefore, credit card business can achieve large-scale card issuance without relying on the bank's business institution branches, which enables small and medium-sized banks to break through the "bottleneck" of tangible institutional branch constraints in the development of retail business and vigorously expand the retail business space of banks through credit card business.

## **4. The Development Status and Risk Analysis of Credit Card Business in Commercial Banks in China**

### **4.1. The Development Status of Credit Card Business in Commercial Banks in China**

#### **4.1.1. Rapid Development of Credit Card Business**

In recent years, with the transformation of residents' consumption concepts and the establishment of China's personal credit system, there has been fierce competition among commercial banks in the credit card market. The number of credit card issuance in China has rapidly increased, and the proportion of bank card issuance has also further increased.

According to statistics from the central bank, as of the end of 2020, a total of 2.415 billion bank cards had been issued nationwide, a year-on-year increase of 16.9%, and a growth rate of 2.2 percentage points faster than the same period last year. Among them, the number of credit cards issued was 229 million, with a year-on-year growth rate of 23.7%, accounting for 9.48% of the total number of bank cards issued, up from 8.98% at the end of the previous year. With the continuous improvement of the credit card acceptance environment, as a widely used non cash payment tool for Chinese residents, the issuance of credit cards will continue to grow.

#### **4.1.2. The Credit Card Acceptance Environment is Becoming Increasingly Perfect**

The continuous growth of the domestic economy in the past 30 years has led to the continuous expansion of the card issuance base of commercial banks in China. With the development of China's macro economy, the number of high-income groups in the country continues to increase, providing broad space for the development of credit card business. The changes in the credit card business acceptance environment of commercial banks in China in recent years are shown in Data source: Overall operation of the payment system of the People's Bank of China from 2016 to 2020

As of the end of 2020, the bank card interbank payment system had 2.183 million connected merchants, 3.334 million connected POS machines, and 27100 ATM machines, an increase of 616500, 925700, and 56100 units compared to the end of 2019, respectively. As of the end of 2020, the number of bank cards corresponding to each ATM in China was 8913, a year-on-year decrease of 7.3%; The number of bank cards corresponding to each POS is 724, a year-on-year decrease of 15.6%, and the construction of the bank card acceptance market is continuously showing effectiveness.

### 4.1.3. Improvement of Credit Card Service Quality

The credit card industry has strong homogenization and fierce competition, which has mainly focused on product segmentation and additional services. Each issuing bank will make comprehensive adjustments and upgrades based on the current situation, and comprehensively improve the service quality of credit cards with customer service as the core. With the increasing promotion of credit cards by domestic banks, the gradual improvement of the credit card usage environment, and the diversification of payment channels, cardholders' awareness of credit cards is gradually increasing. At present, the services in China's credit card industry have been recognized by customers, especially in terms of security, convenience, and other aspects [10].

### 4.1.4. Credit Card Risks are Increasing Year by Year

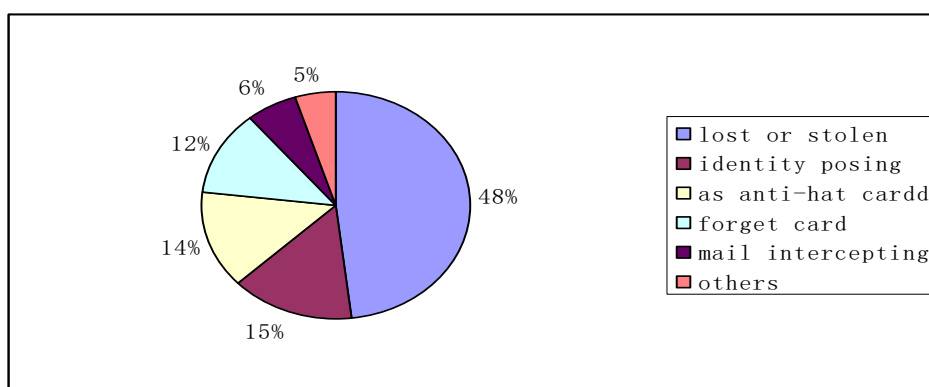
Since the issuance of credit cards by Chinese commercial banks, the proportion of the total outstanding credit at the end of the credit card period to the total outstanding credit at the end of the credit card period has been increasing year by year. From 2016 to 2020, the total outstanding credit at the end of the credit card period and the total outstanding credit at the end of the credit card period of Chinese commercial banks are shown in Table 2:

**Table 2.** 2016-2020 Total Credit Payable and Total Credit at the End of the Period for Credit Cards of Commercial Banks in China

Year	2016	2017	2018	2019	2020
Total outstanding credit at the end of the period (in 100 million yuan)	329.61	750.18	1582.12	2457.58	4491.6
Total credit amount at the end of the period (in 100 million yuan)	3063.93	5577.12	9804.57	13634.96	20000
The proportion of total outstanding credit at the end of the period	10.76%	13.45%	16.14%	18.02%	22.46%

From the table, it can be seen that with the continuous deepening and development of China's credit card market, the total amount of credit at the end of the period for credit cards continues to rise, indicating that China's credit card market is thriving and developing, while also revealing that more and more cardholders are using credit cards for consumption. The proportion of the total outstanding credit card credit at the end of the year to the total credit card credit at the end of the year shows an increasing trend year by year. This means that commercial banks in China are occupying more and more funds in credit card business, and the occurrence of cardholders unable to repay on time is becoming more and more frequent. The operational risk of credit card business in commercial banks in China is increasing year by year.

## 4.2. Risk Analysis of Credit Card Business



**Figure 1.** Distribution of International Credit Card Fraud Risk

Credit card risk involves various aspects such as issuers, cardholders, and special merchants, running through various stages of credit card use and payment, mainly including credit risk, operational risk, fraud risk, technical risk, etc.

#### **4.2.1. Credit Risk**

Credit risk refers to the possibility of losses caused by the failure of credit card holders to repay their debts on time due to credit factors, resulting in default and the inability of banks to recover overdraft advances. Credit risk is the most important aspect of credit card risk and has a significant impact on the profitability of the business.

The occurrence of credit risk is mainly due to changes in the customer's credit status [11]. When credit cards are issued, the customer's credit is reviewed and a certain credit limit is given to the customer for recycling. Some cardholders are in good financial condition when applying, but later due to some special reasons, their financial situation becomes crisis, resulting in inability to repay the credit card debt; If banks cannot dynamically review their credit limits based on customers' financial conditions in a timely manner, they may suffer losses. In addition, the economic situation

#### **4.2.2. Operational Risks**

Credit card business is an electronic business that requires business personnel to perform various operations, and any carelessness may bring huge risks. Firstly, there are operational risks for bank staff, such as errors caused by careless entry of bank credit card information, unauthorized approval and issuance of credit cards by bank employees, and unreasonable funding limits given to applicants; Secondly, there are operational risks for special merchants, such as the cashier not verifying the cardholder's ID and reserved signature according to regulations when receiving payments, or allowing the cardholder to consume more than expected; Finally, there is the risk of committing crimes, which mainly refers to the use of power by relevant business personnel of banks to commit crimes internally, or collude with illegal individuals in society to commit crimes, steal cardholder information, and so on.

#### **4.2.3. Fraud Risk**

Fraud risks include fraudulent applications and fraudulent transactions. Fraudulent application refers to a fraudster who steals someone else's identity information and applies to open a credit card. Fraudulent transactions refer to fraudsters stealing cards or information on cards for card swiping. From a global perspective, the distribution of international credit card fraud risks is shown in Figure 3:

#### **4.2.4. Technical Risks**

The hardware and system software used in China's credit card business are mostly imported products, and the core technology is mastered by foreign countries. If there are problems, a huge threat will exist in the system. Secondly, self-development and program outsourcing are two modes of application software development, and either method will leave hidden dangers due to high personnel turnover. For example, developers who have a thorough understanding of the application may disrupt the operating system or steal bank funds for certain purposes. There are also technical risks posed to credit card business by internet attacks and network virus attacks that currently exist.

Any financial market business is accompanied by risks and returns. Banks not only make substantial profits from credit card business, but also find it difficult to avoid risks. However, with the rapid development of modern science and technology, banks can calmly face various credit card risks, analyze the formation of risks, identify the types of risks, evaluate the size of risks, use efficient strategies to cope with risks, and adopt sound mechanisms to control risks.

## **5. Inspiration from the Risk Management Experience of Credit Card Business in Developed Countries**

### **5.1. The Experience of Risk Management in the US Credit Card Market**

After the world's first credit card appeared in the United States in 1915, the United States relied on its strong economic foundation, sound legal system, and market economy system to create the largest credit card industry in the United States, making it the most developed country in the global credit card industry [12]. The huge credit card industry has brought huge benefits to American card issuing companies and made significant contributions to driving the development of the US economy.

Due to the impact of the financial crisis and economic weakness, the US credit card business suffered its toughest winter ever in 2009. Due to the outbreak and spread of the subprime mortgage crisis, the housing market has repeatedly adjusted downwards and continuously raised interest rates, resulting in a continuous increase in household debt. In addition, the unemployment rate has continued to rise due to the subprime crisis, and the financial situation of a large portion of American residents continues to deteriorate, causing consumer credit to be in a difficult situation and significantly increasing the risk of credit card assets.

Of course, in the face of the risks faced, it is necessary to rationally face the enormous contribution made by the United States to the global credit card industry. There are two valuable experiences for Chinese commercial banks to learn from the prosperity and development of the credit card industry in the United States:

### **5.2. Perfect Legal System Protection**

The United States has first improved its credit card related laws and regulations, and a sound credit law and regulation system has played an important role in the development of the credit card industry. Firstly, it has stabilized the order of various economic activities in credit card operation, ensuring the interests of all related parties of credit cards. Secondly, it effectively protects consumers' privacy and other legitimate rights and interests.

### **5.3. Enlightenment from the Practice of Risk Management in the Korean Credit Card Market**

The development of credit card business in South Korea started relatively late, and the 1997 Asian financial crisis triggered the Korean financial crisis, causing unprecedented impact and losses to South Korea. In order to stimulate domestic demand and stimulate economic growth, the South Korean government has encouraged consumers to use credit cards for consumption through various policies such as tax incentives, and relaxed the control on credit cards. The government attaches great importance to and industry support policies, and credit card transactions have been widely applied in the economic life of South Korea. The traditional family finance and consumption concepts in South Korea have undergone significant changes, and the consumer demand of the people has increased. The consumer credit market for residents has been developed, and South Korea has once again embarked on a growth trajectory from the economic downturn caused by the Asian financial crisis.

## **6. Risk Management Measures for Credit Card Business of Commercial Banks in China**

The credit card industry is an emerging industry in China, and its development level is closely related to the daily life of the public and the operation of the entire economy and society. Based on the experience and lessons learned from foreign credit card market risk management practices, in order to effectively prevent and control risks, issuing banks should take the following measures to improve the level of credit card market risk management.

## **6.1. Improve Legal and Regulatory Systems**

A sound legal and regulatory framework, as well as a sound credit supervision system, will create a favorable economic operating environment, reduce credit and legal risks, and be beneficial for banks to expand their credit card scale and bring profits to them. The rights and responsibilities of issuing banks, cardholders, and accepting merchants have not yet been clearly defined by relevant legislation in China. As a financial institution, it is necessary to urge the improvement of the legal and regulatory system.

External legal and regulatory supervision alone is not feasible, and more importantly, it is necessary to strengthen management to control internal operational risks. The formulation of effective credit strategies, the establishment of rigorous approval and review procedures, the reasonable allocation of responsibilities among departments, the reasonable review of cardholder credit, and the mutual constraints of various businesses and links can all strictly control internal operational risks through the implementation of these measures.

## **6.2. Establishing a Scientific Personal Credit Reporting System**

The establishment of a social credit system can help to understand the economic and credit conditions of potential customers through historical data analysis. Issuing banks' credit will be more reasonable and reliable, and they can reject customers with poor subjective credit awareness outside the social credit system, thereby reducing the bank's ability to reduce bad debt levels and credit risks.

The personal credit reporting system in China began pilot testing in 1999 and was officially put into operation in 2004. It mainly collects and stores personal credit information such as bank loans, credit cards, guarantees, and related identification information. The personal credit reporting system in China is not yet perfect, and the inability to fully identify customer credit status is currently the biggest obstacle to the development of credit card business, which poses significant risks and costs to card issuers and is not conducive to the healthy development of the entire credit card industry.

## **6.3. Design a Scientific Credit Scoring Model**

Credit score is a statistical method used to predict the probability that loan applicants or existing borrowers will default or default. The credit scoring model is a predictive model that systematically analyzes a large amount of data such as consumer basic characteristics, credit, and behavioral records, excavates the behavioral patterns and credit features contained in the data, and obtains the relationship between historical information and future credit performance. It uses a credit score to comprehensively evaluate a consumer's future credit performance.

The credit card lifecycle is divided into four stages: application acceptance and approval, customer relationship maintenance and management, collection, and verification. Developed credit card countries such as the United States usually adopt different risk measurement and control measures at each stage of the parties' behavior. Each stage uses different scoring models to quantify credit card risks and achieve automated approval processes, thereby improving loan processing efficiency. There is still a significant gap between China and foreign countries in terms of credit scoring for credit card risks. Therefore, China needs to learn from advanced foreign experience, combine the current situation of credit card risk management with continuous improvement of relevant technical conditions, and design a credit scoring model that meets its own needs as soon as possible to improve the efficiency of credit card risk management.

## **7. Conclusion**

This article first elaborates on the product types and business characteristics of credit cards, deeply analyzes the current development status of China's credit card business, analyzes the risks of domestic credit card business, and draws the following research conclusions: the rapid development of credit card business, the increasingly perfect credit card acceptance environment, and the significant

improvement of credit card service quality. However, various card issuing behaviors seize the market share of credit cards, and the phenomenon of blind card issuance is serious, Credit card risks are increasing year by year. These risks can be categorized into four common categories: credit risk, operational risk, fraud risk, and technical risk. Using comparative analysis methods, combined with the successful experience and practices of advanced credit card risk management in the United States, to reflect on the lessons learned from the failure of credit card risk management in South Korea; Proposed strategies and suggestions for improving risk management of domestic credit card business. The first is to improve the legal and regulatory system, the second is to establish a scientific personal credit reporting system, the third is to design a scientific credit scoring model, and the fourth is to strengthen the construction of social credit ethics.

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