

## Research on Computer Network Financial Risks and Preventive Measures in the New Period

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**Abstract:** The development of e-commerce has had a tremendous impact on the political, economic and cultural fields of the whole society. Under the impact of this trend, the financial industry is also facing unprecedented development opportunities and new challenges. As a virtual working environment of a physical bank, online banking, like online shopping, not only has the same risks as in reality, but once there is a problem after the transaction, there will be many differences and it is difficult to investigate. At present, the state is not perfect in terms of technical measures and legislative guarantees in these areas. Therefore, its existing problems are becoming more and more obvious. The most important one is the security risks of online banking. It is necessary to accurately grasp the various aspects that affect the safe operation of online finance. Inducing factors, taking effective measures, plugging loopholes, continuously strengthening and improving the security performance of network financial operations, and enhancing their security are the top priorities for promoting the healthy development of online finance. Through the investigation and analysis of online banking and online financial security, this paper enumerates the network financial security problems faced by China's online banking system and the degree of networkization of Chinese financial institutions and their existing problems. Through the computer professional network security precautions and the corresponding national laws and regulations, the security precautions of the bank computer network system and the countermeasures to ensure China's financial security in the network era are clarified.

### 1. Introduction

At present, the Internet has served in more than 180 countries and regions, serving about 600 million users. With the continuous promotion and evolution of network technology, the continuous innovation of network access equipment has made the Internet more convenient and convenient, which has brought great convenience to individuals and companies to save money and transfer money and other cumbersome things, and also provides online banking. The space for survival and continuous development. The development of e-commerce technology has spurred online banking. The ultimate goal of e-commerce is to achieve the integration of online logistics, information flow, business flow and capital flow, thus forming a low-cost, high-efficiency commodity and service trading activity. With the deepening of the network economy and the development of e-commerce, banks are required to provide mutually compatible online payment systems, and online banking is required to provide virtual financial services that are suitable for them, thus posing a severe challenge to the traditional banking payment system.

Under normal circumstances, finance refers to the manufacture, circulation and withdrawal of money, the issuance and recovery of loans, the deposit and withdrawal of deposits, and the exchange of exchanges and other economic activities. Under such conditions, the supervision of financial activities is easy to operate, the performance of financial security is relatively intuitive, and financial security can be achieved well through audit trails and other means. With the advent of the era of

knowledge economy, the emergence of the Internet has made the whole world a "global village." At the same time, the traditional financial concept has undergone profound changes. The emergence of a new financial operation system characterized by electronic money, online banking, and e-commerce has given us new questions on how to ensure the financial security of countries in the Internet era.

Internet finance, also known as e-finance, refers to financial services on the Internet, including online banking, online securities, and online insurance and other related services. In a broad sense, online finance is supported by network technology, the general term for all financial activities in the world, including not only narrow content, but also network financial security, network financial supervision and many other aspects. It is different from the traditional financial activities in physical form. It is a financial activity that exists in the electronic space. Its existence form is virtualized and its operation mode is networked. It is the product of the rapid development of information technology, especially Internet technology, and it is the financial operation mode of the network era that is adapted to the needs of e-commerce development.

## **2. Main Features of Internet Finance**

The application of the network in financial business can improve the competitiveness of financial institutions. Its main features are:

(1) **Virtuality:** Financial institutions in the Internet age usually show that there is no building, no address and only a website, but the website can be queried for a specific geographical location. After entering the website, according to the corresponding picture or font prompt screen to achieve all credit recharge, participate in sales activities and other transactions, it does not have real banknotes and even coins, all financial transactions are carried out on the network with digital information, so that it can improve Quality and speed, reducing the operating costs of financial institutions, there will be no problems with good or bad geographical location.

(2) **Directness:** The network makes the interaction between the client and the client or the financial institution more direct. It does not require the parties to make an appointment for the transaction time and location. In addition, the network creates excellent conditions for the international flow of capital, and savings and investment are not affected by geographical problems, making allocation more effective. Countries that require large investments or bailouts are no longer constrained by a lack of capital. Deposits are no longer limited to the domestic market, but investment opportunities can be sought around the world.

(3) **Electronic:** The international financial system consists of hundreds of thousands of computer monitors around the world. It is the first international electronic market and the most widely traded. Online trading is more complex than it is in reality, and it is a manifestation of a global economy built on computer space rather than geography. International finance has become a digital market, which has brought many difficulties to the central government in controlling economic and economic activities. At the same time, it also makes the price of some commodities transparent, small profits but quick turnover. At the same time, the cross-border flow of money is monitored and controlled; the total amount of money in a fixed geographical area is very important. In this digital world economy, all of these assumptions are becoming more and more complex, as the diversification of electronic money issuers (both central banks and civil society organizations) makes the participation in online transactions potentially more Risks will inevitably expose us to the issue of how to protect our customers' rights, such as in the event of bankruptcy of electronic money issuers, system failure or loss of smart cards. In addition, in the network economy, fraud and criminal activities will become more subtle. Safety is always an important factor in online finance.

### **3. Risks and Problems in Online Finance**

#### **3.1 Risks of the online banking system**

The network finance business and a large number of risk control work are completed by computer programs and software systems. Therefore, the technical and management security of electronic information systems has become the most important technical risk for network finance operations.

##### **3.1.1 Network financial technology risk**

Invasion and destruction of various types of hackers. The information and data stored and operated in the bank computer network system represent the movement of funds, and also reflect the economic operation of enterprises and countries. In today's fierce economic competition, the banking network system is very vulnerable to various types of hacking. Through various means, they have caused various forms of destruction and utilization of financial security. Some are stealing bank information and engaging in economic illegal activities; some are maliciously modifying the functions of computer systems, and others are fraudulent and stolen funds.

A variety of computer viruses with a variety of names. The computer network virus spreads and spreads through the network, and the transmission speed is several times that of a single machine. As a result, the computer system is paralyzed, and the program and data are seriously damaged, and the whole machine is extremely destructive. In traditional finance, security risks may only bring local losses, but in online finance, security risks can lead to paralysis of the entire network, which is a systemic risk.

##### **3.1.2 Network financial business risk**

(1) Network financial credit risk. In online financial services, online financial services and service organizations have very obvious virtual characteristics. The virtual nature of the online financial service method enables the parties to the transaction and payment to make transactions through the online bank without seeing each other. This makes it difficult to verify the identity and authenticity of both parties, which increases. Network credit risk, which includes not only technical factors, but also institutional factors. This is also a problem that many companies are embarrassed about.

(2) Network payment and settlement risks. Because of the virtual nature of online financial services, financial institutions can provide services to customers in any way, anytime, anywhere. Internet finance users can use their respective computers to handle various financial services with financial institutions in various places. In this way, once a regional financial network fails, it will affect the normal operation and payment settlement of the national and even global financial networks, resulting in great economic losses. In the 1980s, the US financial securities trading system appeared to be able to buy and not sell, and formed more than 20 billion US dollars of debt overnight. A similar situation has occurred in our country.

##### **3.1.3 Network financial system risk**

According to the data, among the cracked people who use computer technology for financial crimes, the internal staff of the bank reached nearly 80%. Bank internal staff can easily use the rights granted, and easily modify, delete, etc. the data in the network, and transfer funds in some accounts. What's more, the insiders of the bank are outside the scope of their own authorization, and they enter and exit the system through the hidden channels of the bank, which not only causes extremely bad effects, but also becomes a breakthrough for the hacker system and the security of the entire system and the security of the data. The violation of internal personnel should be more severely punished.

#### **3.2 The degree of networkization of financial institutions and existing problems**

##### **3.2.1 Problems in the development of China's online finance**

With the continuous development of China's information industry and the gradual opening up of China's financial market, coupled with economic globalization and China's basic national policy of opening to the outside world, China's financial industry will also be integrated into the world economy. At present, China's securities trading has basically achieved nationwide networking, online stock trading has been growing, and ICBC and other financial institutions have also established local

area networks. Among them, Bank of China has established a networked network with the head office data processing center as the core.

On the objective side, there are two main problems: First, the business scale is limited, the income level is not high, and basically it is at a loss. Second, online financial services have obvious primary features. Most of China's online financial products and services simply “move” the traditional business, and regard the network as a sales method or channel, ignoring the innovation potential of online financial products and services.

On the subjective side, there are two main problems: First, failure to carry out effective unified planning. Due to the lack of macro-coordination in the development of China's online finance, financial institutions not only have their own choices in terms of development mode selection, electronic equipment investment, and network construction, but also keep each other secret and mutual defense, resulting in waste of information, technology, capital and internal structure. The malformation is not only not conducive to the development of online finance, but also the factors of instability in the financial industry. Second, the legislation is lagging behind. On the one hand, compared with developed countries in the market economy, China's online financial legislation is lagging behind. Such laws in China are extremely limited. There are only a few regulations such as the “Interim Administrative Measures for Online Securities Entrustment” and the “Approval Procedures for Online Entrusted Business of Securities Companies”, and only a small part of the online securities business. On the other hand, compared with the sound legal system of traditional financial services, online financial legislation is also lagging behind. Facing the development of network finance and the arrival of the era of electronic money, it is necessary to further study the revision and improvement of the current financial legislative framework, appropriately adjust the existing supervision and regulation methods of the financial industry, to play its role of regulation and guarantee, and promote the positive of online finance. Steady development.

### 3.2.2 Failure to carry out effective unified planning

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With the participation of foreign financial institutions in China's online finance competition, the weakness of Chinese financial institutions is emerging. This weakness is not only a technical issue, but also a problem of consciousness. Since 1996, Citibank has applied for 19 “business method” invention patents to the National Patent Office of China. These patent applications are mostly financial services and system methods developed in line with emerging network technologies or electronic technologies. The purpose is to control the core technology of e-banking and establish the leading position of online banking. Although China has not yet approved any patents it has applied for, according to the principle of “application for first authorization” of patent applications, once China passes relevant laws and allows to apply for such patents, Chinese banks will face difficulties in entering certain markets. Either pay a higher patent fee, or be forced to withdraw, or even have to pay a fine. Even if China does not authorize such patents, Chinese banks must face Citi's patent barriers when they enter the US or other international markets.

## 4. Network Financial Security Prevention and Countermeasures

### 4.1 Bank network system security

From the network finance is based on network information technology, which allows network finance to continue and integrate traditional financial risks, while also updating and expanding the connotation and extension of traditional financial risks. This is the first security risk in the technical support system of network finance. It is the most fundamental risk of network finance. It is not only

related to the security of network operation, but also related to other financial business risks. Secondly, online finance has not been used in the past. The special risk forms, such as technology selection risks; therefore, in today's increasingly serious network financial risks, the prevention and control of network financial risk security supervision requires new innovative methods to prevent problems before they occur, and to carry out technical defense and system.

#### **4.2 Computer network system technology prevention**

At present, most of the computer software and hardware systems used in the operation and business of financial electronic systems in China are imported from abroad, and the electronic information technology is relatively backward, which increases the security risks and technology selection risks of China's network finance development. Therefore, we should vigorously develop China's own advanced information technology, improve the key technical level of computer systems, and improve the security defense capabilities of key equipment. For example, China's current encryption technology, key management technology and digital signature technology are lagging behind the requirements of network finance development. In this regard, more efforts should be made to develop information technology with independent intellectual property rights, which is to prevent and reduce financial security risks. And technology to select risks and fundamental measures to improve network security performance.

The security of a financial network system basically guarantees the confidentiality, integrity, usability and auditability of its system data. To achieve the above requirements, some practical and effective defense mechanisms should be adopted: ensuring that the data file system in the online state and the confidential information transmitted in the network are not illegally or passively provided to unauthorized persons, and the system resources can authenticate the access users. Identity, guaranteeing access and use of system resources by authorized users. The specific defense mechanism is: in addition to high-level encryption of computer critical data, it is necessary to establish a matching access control system, using security and security devices (encryption machines, firewalls, security gateways, etc.) between system security domains. Restrict user usage by accessing the matrix, such as read-only, write-only, readable and writable, modifiable, fully controllable, and so on. Secondly, to build a comprehensive bank computer system defense mechanism, it is necessary to ensure the security, accuracy and validity of the bank computer system information, and to avoid any form of insertion, deletion, modification or any data stored in the database and transmitted in the network. Retransmission ensures the authenticity of data read, received or used by legitimate users. Its defense mechanism must first install "firewall" and computer virus prevention measures, and secondly establish a good backup and recovery mechanism to form a multi-layer defense. The main hardware and software equipment, data, power supply, etc. must be backed up, and the ability to recover the system in a short period of time, without the loss of resources due to some faults or misoperations of the system.

#### **4.3 Financial system security management system**

Prevent and eliminate network financial security risks from the internal organization and rules and regulations of the financial system, establish a full-time management and technical team specializing in computer crime prevention, and implement corresponding full-time organizations. Comprehensively clean up the existing computer security system, establish and improve various computer security management and prevention systems; improve operational procedures; strengthen key management and improve internal control mechanisms. The establishment of the safety system must be based on the actual conditions of the unit and the technical conditions adopted, with reference to relevant laws, regulations and regulations, to develop a practical and comprehensive safety management system.

The establishment, implementation and supervision of the system should be implemented in specific details. System administrators should review system logs and records on a regular basis. The important positions are cancelled when they are transferred, and the password and key of the business system are replaced immediately, and all relevant technical materials are handed over.

There is also an anti-virus system that stipulates strict use of genuine anti-virus software approved by the state for timely detection of poison and anti-virus.

Finally, it is necessary to strengthen the safety education and legal education of network financial security workers. From the ideological and behavioral point of view, the importance of computer network system security and the long-term, arduous and complex nature of solving this problem must not be relied solely on Advanced technology and advanced products, advanced technology is always relative, human security awareness and subjective initiative is the fundamental solution to the problem, the only way to fundamentally protect the security of network financial computer systems.

#### **4.4 Countermeasures to ensure financial security**

With the increasing degree of financial services networking and the internationalization of China's financial exchanges, financial security issues will inevitably become the most important content of national economic security. It is conceivable that in the future network era, anyone can roam, query, and apply for loans on the Internet, which may lead to network intruders in actual transactions. Whether it is stealing or changing electronic funds, it is a great risk for banks with more credit than everything, and it is a huge loss for the country.

##### **4.4.1 Strengthening the awareness of national financial security**

In the future network era, in the process of our financial exchanges with foreign countries, for various reasons, the gap between China and developed countries in this field is bound to exist for a long time, which requires us to always pay attention to defending the country's financial security. Networking has diluted the concept of the country to a certain extent, but we must see that the differences in ideology between the East and the West will not disappear due to networking. On the contrary, the network provides a certain degree to the implementation of new economic policies. More convenient conditions, in the current unfavorable situation, we must make full use of the opportunities that network provides us, and we must be highly vigilant against its negative side.

##### **4.4.2 Ensuring the security of financial institution information systems**

According to estimates by the US Department of Energy and the Space Agency, more than 120 countries in the world have the ability to launch information warfare, and thousands of computer "hackers" may attack information systems. "In 1994, the US Department of Defense deliberately organized a group of 'hackers' to attack the computer system of the Ministry of Defense. As a result, 88% of the 8,900 computers attacked by 'hackers' were controlled by 'hackers'" compared with the United States. China's information system is much more vulnerable. Therefore, in the process of promoting financial networking, it is necessary to ensure the security of the information system of China's financial system, especially in the important position, especially to strengthen the key technologies of computer systems and the security defense capabilities of key equipment. Specifically, sophisticated protection equipment must be established, including garbled processing technology and firewalls on the client side. And a trusted operating system that protects the trading hub from being invaded, so that data transfer is protected layer by layer from the user's computer. Encrypted transmission of all financial data, enabling users to pass multiple levels of authentication to improve network security.

##### **4.4.3 Improve the accuracy of information on the operation of community financial markets**

On the basis of improving network supervision, we should try our best to improve the quantity and quality of financial market operation information, so as to more accurately resolve the risks of financial activities and smooth financial oscillations, so as to achieve the purpose of reducing financial fluctuations. Because the network information is often mixed, the good and the bad, the false information is often filled. Therefore, it is necessary to strengthen the discriminating and sorting of the original materials of these networks in order to grasp more and more accurate information as much as possible. The specific measures are to establish a strict network financial certification system, expand the publicity efforts, and let the members of the society know which online banks it meets the standards of online financial management, thus ensuring the healthy and orderly conduct of online financial activities.

## 5. Conclusion

With the rapid development of network technology, the number of vulnerabilities in software systems has also increased, which will bring double pressure on the development of online financial services. The security of money transactions such as online banking, online securities, online payment, etc. has always been a serious concern for financial institutions and our individuals. This paper lists the network finance problems faced by China's online banking system and the degree of networkization of China's current financial institutions and their existing problems. Through the network security prevention of computer majors and the corresponding legal provisions of China, to make corresponding countermeasures for ensuring China's financial security, the risk theory of banking business and the method of risk liability commitment analysis are also used to study the risk prevention strategy of online banking.

By clarifying the concept of online banking and online finance in the field of online finance, the paper puts forward the risk theory and risk prevention of online banking, and then analyzes and explains risks, risk transfer, risk factors and risk rules, and applies it to online banking risks. Aiming at the security problem of online banking faced by online banking system, this paper proposes the division of network financial risk and summarizes the factors affecting the development of China's online finance. The prevention and countermeasures of network financial security and online financial security are proposed through computer security and national legal security. Finally, with actual crime cases, detailed examples of the manifestations and consequences of online financial crimes in today's society. The full text first defines the financial and network aspects involved, and then puts forward the security issues of China's online banking and online financial services, then proposes countermeasures and precautionary requirements, and finally enhances the actual combination of theory through actual case analysis.

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