

The Study of E-banking Assessment——the Illustration of CCB

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Abstract.In recent years, the users and volume of trade of our E-banking increasing rapidly, the financial electronic has been a new profit growing point of financial institutions. Moreover, this paper, CCB E-banking as the research object, will use AHP, analyzes the problems of E-banking in risk management, and establish the index system so as to evaluate the risk of E-banking management correctly. The bank will control the risk in time, for providing a healthy and good environment of E-banking.

Key Words: E-banking, Risk Management, Index System

1. Introduction

With the rapid development of network economy, electronic banking has grown fast. Since 1995 when Security First Network Bank (SFNB), known as the first electronic bank in the world, was formally open, the electronic banking has widely spread in the following years.

In recent years, as the case of the stealing the capital of electronic bank always happened because of hacker、Trojan horse virus, fraud short message ,consumers have more and more worried about the security of electronic bank.As a result, they dare not or are not willing to use the electronic bank, which becomes the main reason of hindering the sustainable and healthy development of electronic bank. The rapid development of electronic bank does not match the relatively imperfect electronic bank management system.

The paper focuses on CCB electronic bank and applies the method of AHP and Delphi. The paper uses the main statistics of the Shanghai branch of CCB as its sample and analyses CCB electronic bank's problems in risk management.

2. The risk assessment of CCB E-banking

2.1. The analysis of CCB E-banking risks

Risk identification ,the first step of risk management and the stage of determining the object management,is the process of the potential risk in the E-banks to judge and to classify, and identifying the nature of the risk.

2.1.1. CCB E-banking risk identification

In this paper, according to the composition of E-banking and operation model, from the perspective of technical and business, E-banking faces the new risks which can be divided into two kinds: technical risks based on network information technology and business risks based on the features of E-banking financial business.

It is to infer the factors related to the risks existing in CCB E-banking by using the Delphi method and by studying the data of Shanghai branch. The technical experts in the information department, network managers and operation personnel related to E-banking business, etc of 20 people participate in the survey.

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Through collecting the understanding and forecast of the E-banking risks, some have recognized of the nine risks.

2.1.2. The analysis of CCB E-banking risks

2.1.2.1. Technical risks

1. Business operation continuity risk

Business operation continuity risk is the one brought by business interruption and system failure to the bank. The greatest bank losses are caused by the business operation continuity risk. For example, it happened in the certain place that the event of pensioners' failure because the computer system suddenly faulted, which aroused a lot of responses in the society.

2. Security policy risk

(1) System security strategy risk

E-banking is mainly based on the environment of Internet, and open electronic information transmission channels using E-banking result in the problems of system security risk.

(2) Transaction security risk

Since the output, transmission and storage in E-banking system are all clients' sensitive data in the transaction, at this stage, telecom departments provide public Internet network resources for the transmission lines and network system used by E-banking, not the special line of the banking system. So customers of E-banking will face all kinds of security threats.

3. Data concentration risk

CCB in 2005 has achieved both data centralization, which provided an important technical means and conditions for the bank's reform and financial innovation, bringing huge profits for all financial institutions, but the new problems of the high concentration of bank technological risk. In access to E-banking channel, the load balance of data flow, the capacity of the broadband network, the processing ability of core host and so on request the system with a high degree of stability, thus bringing tremendous risks to the operation of the system.

4. Outsourcing management risk

Outsourcing information technology refers that the bank based on the provision of services level information system entrusts the providers of information technology service with all or part of the operation (or department) of the information system, and the providers manage and offer the needed information services for the banks. The bank purchases outsourcing service based on the level of service agreed by both parties at the stated price.

5. System defect risk

(1) The computer system defects

Computer hardware resources are vulnerable to natural disasters and artificial damage, and software resources and data information are vulnerable to the computer virus intrusive, unauthorized copy, tampering and destruction. Moreover, electromagnetic radiation which is produced when computer hardware is working and the hardware and software of the natural failure, external electromagnetic interference, etc can affect the computer working normally.

(2) Network security hidden danger

E-banking is mainly based on the Internet environment, and the network communication protocol used by the Internet is TCP/IP which strives to benefit, safety factors not considered, and therefore there are many safety defects. Because the existence of security holes make these procedures in a 'critical' condition, for a bank, in a "critical" state, unpredictable security hidden danger must always be faced.

2.1.2.2. Business risk

1. Internal control management risk

E-banking risk not only comes from the problem of the network technology, but also from the imperfect internal control system. In the commercial bank with a perfect internal control system, the loss caused by the external fraud should be greater than the internal one. However, in our country, the cases about the banks' internal fraud are the most important event type of operation risk loss not only in the number but also the loss amount, so there are also big problems in the commercial banks internal control.

2. Reputation risk

Reputation risk refers to the risks caused by negative public opinions. If E-banking produces negative public opinions for the problems of products, services, transmission channel or process so as to seriously influence on the revenues or damage the capitals, so reputation risk will happen to E-banking. In the condition of the network economy, the openness of the Internet makes market competition unprecedented fierce, and it is more difficult for the bank to establish his reputation than ever before, but it is a piece of cake to damage the enterprise's reputation.

3. Legal risk

Legal risk faced by E-banking is due to undefined law. While E-bank grow rapidly, it is inevitable to appear conflict or legal problems caused by the use of E-banking. For E-bank, this new field, at present, the legal system of our country not perfect, the law has not clear rules to the conflicts produced by E-banking. Therefore, after the dispute, the customer may appeal court, so that banks may cause the judicial, regulatory punishment, or bad influence such as reputation losses.

4. Customer operation risk

In addition to the internal risks of the network and the banks, the risks caused by the client's wrong operation and use is also an important part to the one of E-banking business. At present, the customers' safety consciousness is poorer. Moreover, banks will lower the popularization of the knowledge about information security, lacking the experienced guidance for the clients and a reminder of the emergency. And customers don't know what risks will happen before the electronic trade, so to take security measures for the initiative is poor.

2.2. CCB E-banking risk assessment

2.2.1. The structure of risk assessment indexes system

This paper synthetically considers the various factors affecting the security of E-banking, refers to E-banking business management method and E-bank security assessment guidelines and other rules published by the China banking regulatory commission, based on the result of risk identification analysis in CCB E-banking, using the method of analysis and COBIT, extends to the index of level 3, establishes the system of index including the security policy risk, internal control management risk, reputation risk, business continuity risk, legal risk, outsourcing management risk, data concentration risk, customers' operation risk, system defect risk, and form E-banking risk evaluation index level system containing the board/management risk, key technology risk, customer risk and inherent risk. As shown in table 2.1.

2.2.2. Implementing risk evaluation

2.2.2.1. The calculation of risk evaluation index

1. To determine the weight

According to the two two comparison results of the evaluation index, based on AHP in the second chapter, the index in all grades is got, the weight distribution seen in table 2.1.

Table 2.1 The weight distribution of risk index

One Class Index	Two Class Index	Three Class Index	Index Weight
Board/management risk $W_1=0.48329$	X_a security policy risk $W_a=0.7500$	X_{a1} the process and rationality of formulating security strategy	$W_{a1}=0.5525$
		X_{a2} the security strategy of designing and developing	$W_{a2}=0.2133$
		X_{a3} the security strategy of system operation and maintenance	$W_{a3}=0.0939$
		X_{a4} the security strategy of customer information	$W_{a4}=0.1404$
	X_b internal control	X_{b1} science and suitability of the overall construction in the internal control system	$W_{b1}=0.5609$

	management risk $W_b=0.2500$	X_{b2} construction and operation of internal audit system X_{b3} managing the business staff in E-banking X_{b4} construction and operating the mechanism of the safety monitoring	$W_{b2}=0.2290$ $W_{b3}=0.0870$ $W_{b4}=0.1230$
Key technology risk $W_2=0.2720$	X_c business continuity risk $W_c=0.5525$	X_{c1} the system of intrusion detection and the mechanism of report reaction	$W_{c1}=0.4940$
		X_{c2} the system of risk warning	$W_{c2}=0.1325$
		X_{c3} the strategy of backup and emergency	$W_{c3}=0.2178$
		X_{c4} the emergency plan of E-banking business operation	$W_{c4}=0.0960$
		X_{c5} the equipment of ensuring continuous operation of business and the capacity of system	$W_{c5}=0.0597$
	X_d outsourcing management risk $W_d=0.2133$	X_{d1} the level of supplier service	$W_{d1}=0.6370$
		X_{d2} the control of contract control and the ability of management	$W_{d2}=0.2583$
		X_{d3} the flexibility of the outsourcing agreement	$W_{d3}=0.1047$
	X_e data concentration risk $W_e=0.1404$	X_{e1} perfecting the strategy of data backup	$W_{e1}=0.6667$
		X_{e2} implementing the strategy of data backup	$W_{e2}=0.3333$
X_f system defect risk $W_f=0.0939$	X_{f1} the security of application system	$W_{f1}=0.5714$	
	X_{f2} the control of application system	$W_{f2}=0.2857$	
	X_{f3} technology facilities of the Internet	$W_{f3}=0.1429$	
Customer risk $W_3=0.1560$	X_g customers' -operation risk $W_g=1$	X_{g1} Customer information confidentiality provisions on the implementation	$W_{g1}=0.2000$
		X_{g2} the security measures of customer information privacy	$W_{g2}=0.8000$
Inherent risk $W_4=0.0882$	X_h reputation risk $W_h=0.1667$	X_{h1} the effectiveness of scheme on reputation risk	$W_{h1}=0.5450$
		X_{h2} the sound system of reputation risk	$W_{h2}=0.2329$
		X_{h3} the perfect solutions of reputation risk	$W_{h3}=0.1385$
		X_{h4} the ability of dealing with reputation risk	$W_{h4}=0.0837$
	X_i legal risk $W_i=0.8333$	X_{i1} the ability of processing dispute	$W_{i1}=0.4692$
		X_{i2} the consummation of compensation system	$W_{i2}=0.0901$
		X_{i3} the consummation of manage contract	$W_{i3}=0.0638$
		X_{i4} internal systems conforming to organization rules and regulations	$W_{i4}=0.2069$
		X_{i5} internal systems conforming to the state law	$W_{i5}=0.1700$

2.2.2.2. Comprehensive risk assessment

1. Variable declaration

(1)The set of factors $L=\{L_1,L_2,\dots,L_n\}$ ($i=1, 2, \dots, n$), L_1 is the evaluation index including the two class and the three class index.

(2)The set of comments $V=\{\text{excellent,good,general,qualified,worst}\}=\{90,80,70,60,40\}$.

(3) W_i for various index weight in table 2.1

2. Evaluation process

According to the set of comments V , determine the percentage of the 3 index L awarded V_j , we can get evaluation matrix $L=(L_{ij})$ of the 3 indexes, the evaluation result of 3 index $B=w_i L_{ij}$ as the input of 2 index, to the next level $M=w_b B_{ij}$, and then to the next level $Q=w_e B_{ij}$. Among them, the w_i is for the weight to 3 index, w_b is for the weight of 2 index, w_e is the weight 1 index, and Q is for the result of comprehensive evaluation.

3. Calculation process

$$B_a=(W_{a1} W_{a2} W_{a3} W_{a4}) L_{ij}= (0.2133,0.7867,0,0,0)$$

$$B_b=(W_{b1} W_{b2} W_{b3} W_{b4}) L_{ij}= (0.02175,0.9564,0.02175,0,0)$$

$$B_c=(W_{c1} W_{c2} W_{c3} W_{c4} W_{c5}) L_{ij}= (0,0.66763,0.303965,0.224425,0)$$

$$B_d=(W_{d1} W_{d2} W_{d3}) L_{ij}= (0,1,0,0,0)$$

$$B_e=(W_{e1} W_{e2}) L_{ij}= (0,1,0,0,0)$$

$$B_f=(W_{f1} W_{f2} W_{f3}) L_{ij}= (0,0.51431,0.48569,0,0)$$

$$B_g=(W_{g1} W_{g2}) L_{ij}= (0,1,0,0,0)$$

$$B_h=(W_{h1} W_{h2} W_{h3} W_{h4}) L_{ij}= (0,1,0,0,0)$$

$$B_i=(W_{i1} W_{i2} W_{i3} W_{i4} W_{i5}) L_{ij}= (0,1,0,0,0)$$

$$M_1=(W_a W_b)(B_a B_b)=(0.1654125,0.829125,0.0054375,0,0)$$

$$M_2=(W_c W_d W_e W_f)(B_c B_d B_e B_f)=(0,0.7709,0.2167,0.1239,0)$$

$$M_3=W_g * B_g = (0,1,0,0,0)$$

$$M_4=(W_h W_i)(B_h B_i) = (0,1,0,0,0)$$

$$Q=(W_1 W_2 W_3 W_4)(M_1 M_2 M_3 M_4)=(0.0799,0.8546,0.0615,0.0337,0)$$

$$D=QV=81.838$$

Therefore, the comprehensive score of risk evaluation index of E-banking CCB Shanghai Branch is 81.838 after quantification.

2.2.2.3. Analyzing the result of risk assessment

From the analysis of the weight value and the comprehensive evaluation result, the result of the comprehensive evaluation is 81.838, being general risk and operating generally, and the agency is basically normal institution. Meanwhile, combining with the possibility of occurring the E-banking risk from the participants, according to 2 index, we put forward the table of risk degree. As shown in table 2.2.

Table 2.2 The analysis of E-banking management, CCB Shanghai Branch

Category of Risk	the Possibility of E-Banking Risk					Concerns
	Great	Larger	Moderate	Less	Little	
security policy risk			√			general attention
internal control management risk	√					taking effective measures
reputation risk				√		general attention
business continuity risk	√					taking effective measures
legal risk				√		focusing
outsourcing management risk			√			focusing
data concentration risk			√			focusing
customers' operation risk		√				taking effective measures
system defect risk			√			general attention

To sum up, CCB Shanghai branch has stronger the ability of risk control, but internal control management risk, business continuity risk, customers' operation risk strengthening management, effective measures should be taken to prevent. At the same time, security policy risk, outsourcing management risk and data concentration risk should be focused importantly on, and reputation risk, legal risk and system defect risk could be paid general attention to.

3. Conclusion

The article used China construction bank electronic banking as the research object, to conduct risk assessment about the present and potential Electronic bank, by AHP. Through this paper research and analysis, we can get the following conclusion.

As far as the construction bank Shanghai branch electronic banking is concerned, it has risks such as Business operation continuity risk, Data concentration risk, outsourcing management risk, system defect risk and security policy risk at technical level. At business level, it has risks such as internal control and management risk, reputational risk, legal risk and customer operation risk.

The risk of technical level is very outstanding, especially the security risk, which becomes the key factor of influence on the electronic bank's improvement. Second, law risk and reputation risk are also important. But it must make sure that assessing banking risk should consider comprehensively about all aspects of banking business risk.

The article applies the AHP, and unites the expert group's risk assessment data. It does the risk assessment with the qualitative and quantitative methods. It concludes that electronic banking risk belongs to normal risk and this organization is normal. But, as a state-owned bank, it is time for the Construction Bank to take measures, considering the low-risk operation and high-profit level, to improve the level of electronic bank profit.

4. References

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