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## Relativity Research Between Information Technique Innovation and Risk Control Capability in China's State-owned Commercial Banks

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**Abstract:** The information technique innovation gradually became the most important power source due to the impact of "information technique paradox", which promoted the risk control capability of stated-owned commercial banks. Research assumption and factor system are given. The structure equation model is established. The data collection, credit certification, validity certification and model identification are conducted. Results show that,  $\alpha$  coefficient is 0.8989. The inside consistency coefficient of 4 index is 0.7134 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for technique innovation of information technique factor. The minimum of load is 0.61 and the biggest value is 0.92 for these 12 indexes of information technique innovation measure system. The minimum T is 2.11, the RMSEA is 0.043, the NNFI is 0.9323 and the CFI is 0.9121. It is clear that the measure system has better credit and validity. The application innovation of information technique enhances the credit risk control ability, market risk control ability and comprehensive risk control ability in state-owned commercial banks.

**Key words:** Structure equation model, core competence, commercial banks, innovation

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### INTRODUCTION

The information technique is the one of the most scientific achievement of human society in the 20th century and has brought out profound impact for the development of human society. Similarly, the wave of information technique has also had a strong impact in the financial field, causing massive financial innovation fruit and promoting the rapid development of finance. The appearance of electron banks is the one of the important achievement of information technique innovation (Zhang, 2000; Zhang and Zhang, 2008).

Electron banking is a kind of system engineering which is set up at a frame of national information foundation and is composed of communication network, computer, information resources and human resource. The innovation of the bank information technique is a king of processing which can acquire great enterprise performance and economic benefit by making the most of the information technical development result and relying on existing manpower, funds, real object resource and through the reformation to the traditional business process and the management method which includes CRM, enterprise decision, the funds row, letter the loan, middle business, human resource development and accounts processing (Zhang, 2007; Lu and Zhang, 2008).

The "New Basel Capital Accord" was executed at the end of 2006 by the West Group of 10 international banks, which put forward the new management ideas for banks management in the world. The Accord not only describes the three pillars of market constraints including capital requirements, supervisory authority of supervision and inspection but also expounds the risk management philosophy of commercial bank form different perspectives. The function of commercial banks is no longer simple credit intermediaries and financial services but risk management in the framework of the New Basel Accord. In other words, the risk management is the core function and radical task of modern commercial banks. The "New Basel Accord" not only has changed the traditional banks operations philosophy and enhanced the risk management to a new strategic height but also has pointed out the new direction of risk control of international banks industry and provided useful guide thinking and risk control implementation (Lu and Zhang, 2008; Zhang, 2008).

At present there are many problems in risk management practice of state-owned commercial banks: Lacking of both strategic guidance and tactics experiments; lacking of both comprehensive risk awareness and specific issues analysis; lacking of applying ability of risk measure tool and effective measure

indexes structure; neither integrating the qualitative and quantitative analysis method nor constructing the whole theory framework from past management experience. In short, the management capability of state-owned commercial banks is still in the West Bank's risk management level of the 1970s. Therefore, it is not only an important operation objective but also a long-term strategy to enhance the risk control capability of state-owned commercial banks.

## RESEARCH ASSUMPTION

The information technique innovation factor of state-owned commercial bank may be resolved to three main indexes: Technique innovation ( $\xi_1$ ), application innovation ( $\xi_2$ ), management innovation ( $\xi_3$ ) and. The technique innovation means that the information technical research result promotes the function of the commercial bank information system; the application innovation means that the information technical research result applies to business process reengineering of commercial bank; management innovation means that the information technical research result improves the management behavior of commercial bank (Zhou, 2011; Gu *et al.*, 2012).

The risk control ability factor of state-owned commercial bank may be resolved to four main indexes: Credit risk control ability ( $\eta_1$ ), market risk control ability ( $\eta_2$ ), operation risk control ability ( $\eta_3$ ) and comprehensive risk control ability ( $\eta_4$ ). The credit risk, market risk and operational are the three major risks of commercial banks and the risk reserve fund of these three risks occupies the 90 percent of total risk reserve fund of commercial bank, so the risk control ability to these three risks may basically reflect the commercial bank's overall risk control ability. Therefore these three risk control may be regarded as single index of risk control system and the comprehensive risk control capability refers to those elements which positive impact for all types of risk control (Du, 2009; Ji, 2011).

This research may put forward the research assumptions between information technique innovation and risk control ability according to the background of theoretical analysis.

The technique innovation factor of information technique of state-owned commercial banks include four measure indexes: (1) Software technique innovation (X1), means the innovation of software facilities including database, operation system etc.; (2) Hardware technique innovation (X2), means the innovation of hardware technique including host, exchange machine and server; (3) network technique innovation (X3), means the function expansion of network technique; technique

out-resource innovation (X4), means the exaltation and improvement of out-resource method and efficiency (Li, 2010; Wu, 2010).

The application innovation factor of information technique of state-owned commercial banks includes four measure indexes: (1) Loan business innovation (X5), means that information technique improve the loan business process; (2) Funds business innovation (X6), means that information technique improves the funds business process; (3) Deposit business innovation (X7), means the information technique improves the deposit business process; (4) Middle business innovation (X8), means the information technique improve the middle business process (Pan, 2008).

The management innovation factor of information technique of state-owned commercial banks includes four measure indexes: (1) CRM innovation (X9), means that the information technique promotes the management function of customer relation; (2) Decision innovation (X10) means that information technique promotes the decision efficiency of management layer; (3) Entrepreneur spirit (X11), means that information technique promotes entrepreneur spirit of leaders; (4) The accountancy manages innovation (X12), means that the information technique promotes the system function of bank accountancy (Zhang, 2010).

The credit risk control ability factor includes four measure indexes: loan procedure control (Y1), referring to the regulation of optimization of loan approval, implementation, monitoring procedures; customer credit investigation (Y2), referring to the ability to avoid asymmetric information in credit market; the improvement of assessment mechanism (Y3), referring to existing a set of complete performance evaluation mechanism of loan business; loan processes auditing (Y4), meaning that commercial banks may execute reasonable supervision and audit for loan process.

The market risk control ability factor includes four measure indexes: market analysis ability (Y5), referring to the understanding of commercial banks for financial market law; market forecasting ability (Y6), referring to the judgment of commercial banks for financial market change trend; risk transferring ability (Y7), referring to the ability of commercial banks to transfer risk from one financial market to another financial market; VAR ability (Y8), referring to the application ability of commercial banks for VAR technique.

The operational risk control ability factor includes four measure indexes: Risk control awareness (Y9), referring to the prevention awareness of whole staff of commercial banks for operation risk; risk measure ability (Y10), referring to the measure ability for many characters

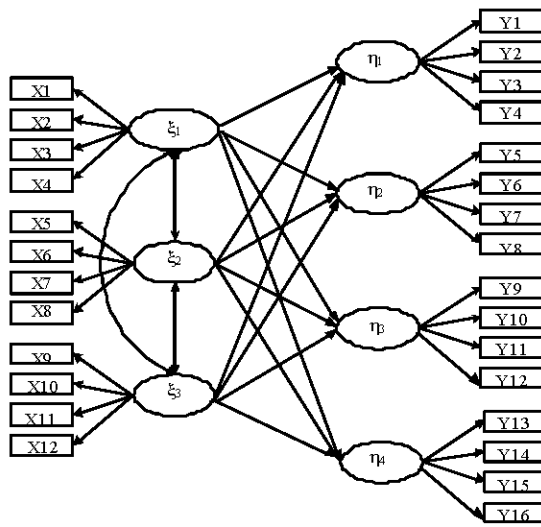


Fig. 1: Structure equation

of operation risk such as the frequency of occurrence, period, loss etc.; risk identification ability (Y11), referring to the identification and prediction ability for operation risk of the whole staff of whole commercial banks; risk contingency measure (Y12), meaning that the commercial banks may be able to take effective measures to minimize the risk harm after operation risk occurs.

Comprehensive risk control ability factor includes four measure indexes: risk information disclosure (Y13), referring to the normative and positive disclosure for all sorts of risk affairs; the professional training (Y14), referring the professional training of various types risk control personnel; database building (Y15), referring to the design of database construction and collection and collation of risk data; risk model application (Y16), referring the ability for commercial banks to conduct risk measurement according to risk model of the Basel Accord.

We can obtain the structure equation model such as Fig. 1 according to the research assumption and structure system analysis.

## MODEL VERIFICATION

This research adopts 7 points measure form to collect data for 28 observe indexes and choose 300 sample in the four bigger state-owned commercial banks in the national scope. All investigation objects are the highest manager of each unit. The totality includes 75 samples of China Industry and Business Bank, 75 sample of China Construction Bank, 75 sample of China Agriculture Bank and 75 sample of China Bank. This inquisition totally takes back 300 valid samples and the valid recovery rate is 100%.

$\alpha$  coefficient is 0.8989 and the cent half degree of model is 0.8012 by exploration factor analysis while total explanation amount is 77% for the information technique innovation measure model. The inside consistency coefficient of 4 index is 0.7134 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for technique innovation of information technique factor, so the 4 indexes can reflect the factor character. The inside consistency coefficient of 4 index is 0.7225 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for application innovation of information technique factor, so the 4 indexes can reflect the factor character. The inside consistency coefficient of 4 index is 0.7389 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for management innovation of information technique factor, so the 4 indexes can reflect the factor character.

The minimum of load is 0.61 and the biggest value is 0.92 for these 12 indexes of information technique innovation measure system while the minimum T is 2.11, the RMSEA is 0.043, the NNFI is 0.9323, the CFI is 0.9121. It is clear that the measure system has better credit and validity.

$\alpha$  coefficient is 0.7863 and the cent half degree of model is 0.8283 by exploration factor analysis while total explanation amount is 76% for the risk control ability measure model. The inside consistency coefficient of 4 index is 0.8235 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for credit risk control ability factor, so the 4 indexes can reflect the factor character. The inside consistency coefficient of 4 index is 0.7237 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for market risk control ability factor, so the 4 indexes can reflect the factor character. The inside consistency coefficient of 4 index is 0.7910 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for operation risk control ability factor, so the 4 indexes can reflect the factor character. The inside consistency coefficient of 4 index is 0.7901 while the relativity and  $\alpha$  coefficient have no bigger fluctuation for comprehensive risk control ability factor, so the 4 indexes can reflect the factor character.

The minimum of load is 0.59 and the biggest value is 0.87 for these 16 indexes of risk control ability measure system while the minimum T is 2.20, the RMSEA is 0.034, the NNFI is 0.9120, the CFI is 0.9010. It is clear that the measure system has better credit and validity.

## MODEL IDENTIFICATION

This study adopts the SPSS11.5 and LISREL8.7 to certificate the whole model and acquires the effect matrix of outside variable to inner variable such as Table 1. The path coefficient in shadow part lack notation. The match index is shown in Table 2.

Table 1: Effect matrix

Path	Coefficient	Standard error	T-value
$\xi_1 \rightarrow \eta_1$	0.13	0.08	1.59
$\xi_1 \rightarrow \eta_2$	0.28	0.11	2.36
$\xi_1 \rightarrow \eta_3$	0.15	0.11	1.37
$\xi_1 \rightarrow \eta_4$	0.29	0.08	3.61
$\xi_2 \rightarrow \eta_1$	0.19	0.08	2.28
$\xi_2 \rightarrow \eta_2$	0.17	0.09	1.87
$\xi_2 \rightarrow \eta_3$	0.34	0.12	2.77
$\xi_2 \rightarrow \eta_4$	0.32	0.11	2.89
$\xi_3 \rightarrow \eta_1$	0.17	0.06	2.91
$\xi_3 \rightarrow \eta_2$	0.24	0.08	3.00
$\xi_3 \rightarrow \eta_3$	0.11	0.10	1.04
$\xi_3 \rightarrow \eta_4$	0.13	0.09	1.34

Table 2: Match index

Math index	df	CHI-square	NNFI	CFI
Current value	307	523	0.933	0.912
Superior vale			>0.900	>0.900

## CONCLUSION

The technique innovation of information technique of state-owned commercial banks has enhanced the operation risk control ability and comprehensive risk control ability while has no role in improvement of credit risk control ability and market risk control ability.

The application innovation of information technique of state-owned commercial banks has enhanced the credit risk control ability, market risk control ability and comprehensive risk control ability while has no role in improvement of operation risk control ability.

The management innovation of information technique of state-owned commercial banks has enhanced the operation risk control ability and credit risk control ability while has no role in improvement of market risk control ability and comprehensive risk control ability.

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