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Study on the Interrelation Between Information Innovation and Formation of Core Competence in Chinese Commercial Banking

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Abstract: In order to reveal the incentive functions of the information innovative activities in the process of the formation of core competence in Chinese commercial banks, research assumption and path are designed and studied. The structure equation model is established. The index system, data collection, reliability certification, validity certification and model checking are conducted. Results show that, Alpha coefficient and half-value respectively are 0.7936 and 0.7192 in the measurement model concerning core competence and the factorial analysis result is 82%. In the risk control ability formation the intrinsic consistency check coefficients of four indexes is 0.8080. In the state-owned commercial banks information application innovation lacks the significance to the formation of the comprehension service ability and the internal management ability.

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

INTRODUCTION

Although Schumpeter was contemporary with Keynes, Schumpeter's innovation theory was different from Keynes theory in the field of western economy. Schumpeter believed that the innovation can introduce production elements or "the new combination" of the working condition into the production system, which includes four aspects specifically.

The first was to guarantee the inexpensive supplies of raw materials and so on as well as the supply of new materials. The second was to open the new trading route to gain the raw materials or the half-finished products at a price below that charged in the domestic market. The third was to develop the new product which can substitute means of production and means of subsistence in the market. The fourth was to stimulate consumers' desires through the propaganda and develop the coordinated products which can satisfy the desire.

In China the famous bank computerization expert, Professor Zhang Chenghu believed that the bank computerization was based on the national information foundation frame that was composed of the communication network, the computer, the information resource and the human resources; being the comprehensive information network, the bank computerization with the unified technical standard was system engineering of creating the new management mode and service mode through different speed transmission data, voice, graph image and video, which made the computer information system with the intelligent exchange and the value-added service interconnect together (Zhang and Sun, 2006). The bank computerization has made shifts from traditional antiquated working styles to the automation, the service computerization, the management information and the scientific policy-making of business transactions, which has provided fast service and substantially enhanced the enterprise performance in banks (Zhang and Zhang, 2007).

Banks' Information Technology Innovation (ITI) means that on the basis of the existing manpower, funds and physical resources, banks have fully utilized the development achievements of information technology in the field of operation and the management and made the information transformation to the tradition operation flow and the management style in order to gain the better enterprises' achievements and economic interests. These concrete services and the management domains include Customer Relationship Management (CRM), enterprises' decision-making, the fund transfer, the credit verification, the middle service, the human resources development, accounting handling and so on in banking industry(Zhang, 2000).

The core competence is also called core competitiveness, which is a focus on management theory and management practice nowadays, is the premise of continually obtaining the competitive advantage in modern enterprises and is the cornerstone of the

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fifth-generation strategic theory. In the recent 20 years, the core competitiveness theory is leading the development of the advanced theory in the management science and demonstrating stronger superiority (Wang and Zhang, 2007). In 1990, Prahalad and Hamel firstly put forwards the definition of core competitiveness. They believed that the core competitiveness was the accumulated knowledge in organizations, which aimed to how to specially coordinate the different productive skills and the technology schools. In brief, the information construction and the ITI have promoted the formation enormously and enhancement of core competencies in Chinese commercial banks (Zhang, 2007).

According to research results, the information innovation system can be divided into four measurement factors such as ITI, Information Application Innovation (IAI), Information Management Innovation (IMI) and Information Environment Innovation (IEI) in Chinese state-owned commercial banks. The ITI refers to the promotion of information technology research results in the commercial bank information system. The IAI refers to business process reengineering of information technology research results in the main business service in commercial banks. The IMI refers to the administrative improvement of the information technology research results in commercial banks. The IEI refers to the improvement of the information technology research results in the information environment (Zhang, 2007).

According to research results(Wang and Cao, 2005; Zhang, 2008), the core competence system can be divided into four factors such as risk control ability, comprehension service ability, internal management ability and market development ability in Chinese state-owned commercial bank. Risk control ability refers to the control ability of state-owned commercial banks in face of different kinds of operation risks because the banking is essentially engaged in the risk management and the risk control is the most important service behavior in banks' management. The comprehension service ability refers to the operation ability in commercial banks, which is most basic service behavior in the state-owned commercial bank management. The internal management ability refers to the organization, coordinated and optimized ability to internal affairs in commercial banks, which is the premise of banks' different service development. The market development ability refers to the service development ability and the sustained development potential in commercial banks, which is the most innovative service behavior in the process of commercial bank operation.

Take for example Industrial and Commercial Bank of China (ICBC). Nowadays information technologies have been fully integrated into ICBC business management activity and have become the important factors to decide bank customer service and business management level. So the huge international banks with competition ability have invested the enormous human and material resources, in order to achieve the leading peer competitive advantage. In the aspect of funds, ICBC have the annual average investment of nearly fifty hundred million Yuan in the field of the independent innovation, science & technology infrastructure construction and self-service equipment. In the aspect of brain, ICBC has also increased science and technology investment of human resources, so as to form 12000 specialized technical personnel. According to 2010 National Commercial Bank Core Competitiveness Banking from Banker Magazine, ICBC ranked the top due to 0.914 points in "information technology" and won the "best IT bank" once again. There are four successful reasons.

The first is the implementation of IT concentration. On the basis of risk control system, all ICBC loans error rate has never exceeded 2%. In 240 institutions in 34 countries around the world, all operations or business are concentrated in ICBC headquarters in real time. The second is the realization of the electronic services. ICBC can have the access to the electronic finance via online bank and bank of mobile phone. ICBC has more than one hundred million online banking customers and can handle about 60000000 strokes business of Internet banking and electronic banks every day. The third is the implementation of the intensive operation. Based on the concentration data, ICBC has established data warehouse including business processing center, financial trading center, documentation, report center, electronic banking center, telephone banking center, SMS platform, remote authorization and other intensive operation platform and changed ICBC-related decentralized operation mode. It has greatly enhanced the business operation efficiency, as well as service capacity and the corresponding service efficiency of front desk and counter. After the business centralized treatment, accounting quality has increased 10 times higher and remote authorization method makes business processing efficiency increase five times. For example, when ICBC headquarters conducts more than 2500 national statements, ICBC can save sixty hundred million Yuan capital spending. The fourth is management modernization. ICBC have fulfilled application and development of a series of management system via data base. There is the global cash management. In ICBC, 5000 software engineers developed more than 700 kinds of business system software, product system software and management system software, so that the unified marketing management and the unified credit of individual

Table 1: Research hypotheses

Hypothesis name	Path representation
H1a	$\zeta1 \to \eta1$
H1b	$\zeta1 \to \eta2$
H1c	$\zeta1 \to \eta3$
H1d	$\zeta1 \to \eta4$
H2a	$\zeta2 \to \eta1$
H2b	$\zeta2 \to \eta2$
H2c	$\zeta2 \to \eta3$
H2d	$\zeta2 \to \eta4$
H3a	$\zeta3 \to \eta1$
H3b	$\zeta3 \to \eta2$
H3c	$\zeta3 \to \eta3$
H3d	$\zeta3 \to \eta4$
H4a	$\zeta4 \to \eta1$
H4b	$\zeta4 \to \eta2$
H4c	$\zeta4 \to \eta3$
H4d	$\zeta4 \to \eta4$

Fig. 1: Structural equation model

and corporate have been finished. There is credit risk system, including market risk management system and the new supervision system in order to carry out the internal reorganization of capital evaluation and weighted risk assets measurement services on the basis of independent research and development. There is the application of the new performance appraisal. A scientific system appeared from the view of five latitudes such as performance evaluation mechanism, departments, products, customers and employees. It has stimulated the vitality of business and the value of creativity. There is the establishment of information platform for the global sharing. Both state-owned commercial banks and ICBC branch can have the access to information in the same information platform. In fact information innovation has enhanced ICBC's core competitiveness.

The core competence is the time variable (Hu and Cheng, 2009). But the formation of core competence is a dynamic variable, which refers to the increasing condition of the core competence for a period of time. Therefore, the core competence is a static index system, but the formation of core competence is a dynamic index system (Ding, 2008; Yang, 2009). According to the core competence architecture in the state-owned commercial banks, the measurement system of the formation of core competence can correspondingly be divided into be four integrant parts such as the formation of risk control ability (↑1), the formation of the comprehension service ability (↑2), the formation of the internal management ability (↑3) and the formation of the market development ability (↑4) in the state-owned commercial banks (Wang, 2006; Shen and Zhang, 2009).

According to the above theoretical analysis, the research supposition examination is shown in Table 1.

RESRARCH MODEL

On the basis of research supposition and the above contents, the SEM is shown in Fig. 1. Based on the
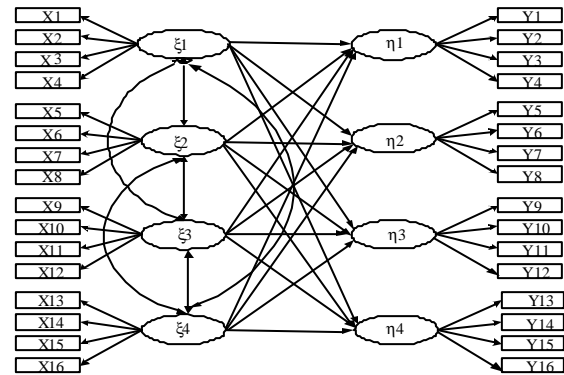
variable covariance matrix, the SEM is one statistical method of analyzing relations between the variable relates (Hou *et al.*, 2004).

The SEM is related to four extraneous source variables ($\zeta1$, $\zeta2$, $\zeta3$, $\zeta4$), sixteen extraneous source targets (X1 to X16), four endogenous variables ($\eta1$, $\eta2$, $\eta3$, $\eta4$), sixteen endogenous targets (Y1 to Y16), sixteen cause-effect relationship as well as six related paths. Such matrix and index as the effect matrix (τ), the effect matrix (β), the extraneous source variable covariance matrix (ϕ), the extraneous source variable factor load matrix (Λx), the endogenous variable factor load matrix (Θy), the extraneous source target variance matrix ($\Theta \varepsilon$), the endogenous target variance matrix ($\Theta \delta$), the model residual covariance matrix (Ψ) and kinds of fitting index can be used to estimate the path coefficient significance, the factor load significance and the factor error variance significance. After revising the model suitably, the most superior model can finally fulfill the confirmation of above theory supposition as shown in Fig. 1.

Data collection: According to 32 observation targets, the survey of industry activity is made by means of seven meter systems. Four hundred samples are selected in the independent accounting units of the four state-owned commercial banks nationwide. The investigation objects are completely senior managerial personnel. These samples come from 16 provinces, cities and autonomous regions including Beijing, Tianjin, Shanghai, Shanxi, Henan, Chongqing, Anhui, Gansu, Xinjiang, Yunnan, Sichuan, Guangdong, Jiangsu, Zhejiang, Hunan, the Inner Mongolia Antonomous Region and so on, which can effectively represent the distribution situation of the state-owned commercial banks. There are 151 copies of samples to China ICBC, 87 copies of samples to China Construction Bank, 93 copies of samples to Agriculture

Table 2: Fitting index tabulation

Fitting index	Df	CHI Square	NNFI	CFI
Current index value	410	556	0.965	0.933
Optimum value trend	-	Smaller is better	>0.9	>0.9

Bank of China, 79 copies of samples to Bank of China, which can represent the distribution situation of the state-owned commercial banks.

Through electronic questionnaire, mail questionnaire, telephone interview and face-to-face talk with 400 investigation objects, 278 copies are valid. This investigation takes back effective sampled data 278, the effective rate of collection is 70%, which has satisfied the requirement that the sample returns-ratio is not less than 20%.

Analysis on reliability and validity: The confirmation factorial analysis results are that 16 factor load's minimum value is 0.52, the maximum value is 0.92, the smallest T value is the 2.09, RMSEA value is the 0.045, NNFI value is the 0.9120, CFI value is 0.9271, the model degree-of-freedom is 82 and Chi-square value is 107.19. Obviously, results of the reliability and validity in the information innovation construction measurement model are quite well.

The exploring factorial analysis results show that Alpha coefficient and half-value respectively are 0.7936 and 0.7192 in the measurement model concerning core competence and the factorial analysis results is 82%. In the risk control ability formation the intrinsic consistency check coefficients of four indexes are 0.8080 and the relevance and Alpha coefficient do not change obviously, therefore these four targets can identically reflect the characteristic of risk control factors. In the comprehension business ability formation the intrinsic consistency check coefficients of four indexes are 0.8012 and the relevance and Alpha coefficient do not change obviously, therefore these four targets can identically reflect the characteristic of the comprehension business ability factors.

Model checking: Having used SPSS11.5 and LISREL8.7 to carry on the entire model examination (fixed variance method), the effect matrix (τ) of the extraneous source variable to the endogenous variable is shown in Table 2.

Therefore, the model's fitting effect is good so that model revision does not need to be made (Hou *et al.*, 2004).

CONCLUSION

In the state-owned commercial banks ITI acts as a stimulus to the formation of the risk control ability, the formation of the comprehension service ability and the formation of the internal management ability in the process of the cultivation of core competence in commercial banks but lacks the significance to the formation of the market development ability. In the state-owned commercial banks IAI acts as a stimulus to the formation of the risk control ability and the formation of the market development ability in the process of the cultivation of core competence in commercial banks but lacks the significance to the formation of the comprehension service ability and the internal management ability. In the state-owned commercial banks IMI acts as a stimulus to the formation of the risk control ability, the formation of the comprehension service ability, the formation of the internal management ability and the formation of the market development ability. In the state-owned commercial banks IEI acts as a stimulus to the formation of the risk control ability, the formation of the internal management ability and the formation of the market development ability, but lacks the significance to the formation of the comprehension service ability.

In order to fulfill the organic integration of marketing system and information system, there are the corresponding steps in banks. Firstly, a unified information collection and service platform should be established. Based on the existing ICBC information platform, different banks should explore the establishment of the unified national banks' consumer-oriented information collection and service platform in China's bank industry. Secondly, the utilization level of information should be improved to enhance the operating efficiency of the marketing system. Owing to a large amount of customer information, banks should satisfy the customer demand as the starting point via the effective information management strength, enabling customers to receive the personalized information and services, accelerate the organic integration of marketing systems and information systems so as to make the quick reaction or changes according to market demand. Thirdly, marketing information system should extend to network ends. In banks all levels of marketing and management personnel, professional analysts and marketing account manager should freely use the main information platform, in order to enhance the level of application of information technology. Banks should increase their marketing personnel training and enhance their application of information technology to carry out market marketing capabilities. Banks should actively explore new business model of network marketing through information technology to efficiently promote information collection, processing and customer brand development.

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