

Internal Audit Model and Influencing Factors of Chinese Listed Banks under Big Data

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Abstract

To discuss the internal audit situation of China's Listed Banks under the background of big data, a panel data multi-regression model was established to verify which factors can influence the quality of internal audit of commercial banks. The regression analysis results showed that: the independence of the board of directors and perfectness of internal audit theoretical basis are positively related to the quality of internal audit of commercial banks. The managerial finance background, managerial ownership and external audit quality have no significant relationship with the quality of internal audit in commercial banks. Finally, the main conclusions are summarized and recommendations and research prospects for strengthening the internal audit quality of commercial banks are proposed by optimizing the operation of internal audit in corporate governance of commercial banks.

Keywords

Commercial banks; internal audit; quality of internal audit; influencing factors.

1. Introduction

In today's era, the development level of financial economy is very important for the whole economy of a country. As a core part of the financial economy, the stability of its operation and development is related to the stability and normal operation of the entire financial order and economic system. In recent years, with the rapid leap economic development, modern commercial banks have grown to the organic body with structural complexity, business diversity, great scale and operation carefulness. Along with the incessant innovation of financial products and emerging financial transactions increasingly frequent, risk and crisis faced by commercial banks are gradually improving, which also puts forward higher requirements for the operation and management of the banking industry [1]. As a special business, for commercial bank, its unique characteristics of operation currency and credit make them possess different characteristics from ordinary enterprises, such as high risk, high debt and instability. Their survival and development environment is closely linked to crises and risks.

2. Related theory

2.1 Definition of internal audit of commercial banks

Sawyer believed that internal audit must first of all have the characteristics of independence. Only when it has independence can we independently evaluate business activities and internal controls in the organization. The second is fairness. Only following the accepted procedures, processes, regulations and standards can we make a fair and objective evaluation of whether the resource utilization is reasonable or not. The definition of the Internal Audit Association (IIA) in 2011 is: "internal audit is an independent and objective confirmation and advisory activity [2]. It enhances and improves enterprise's economic activities and risk management process based on the system process, adopting standardized and scientific operation methods, thus helping enterprises achieve organizational goals, ultimately improving business efficiency and increasing economic value of enterprises." According to the current situation of the definition of internal audit, the internal audit is a full-time institution inside the organization. Through the use of systematic and standardized technology, means and method, we independently and objectively check, supervise and evaluate the

operational manage, financial review, and internal control activities of the enterprises. At last, we can improve the internal organization structure, control operational risks, improve the organization operation and management, improve economic efficiency, achieve the objectives of operation and management and promote the organization value [3].

2.2 Definition of the internal audit quality of commercial banks

The term "quality" refers to the quality of the product or the completion result of a specific work. The result of internal audit is just like the product produced in the process of internal audit. It is a highly generalization and summary of the level and standard of internal audit in the role of enterprise goal management. The quality of internal audit should be divided into two aspects in broad sense and narrow sense. In a broad sense, all actions and results related to internal audit work can be called generalized total quality, specifically including the quality of internal audit management and the quality of internal audit implementation. Among them, the formulation of internal audit regulations, work processes and working standards belongs to the category of management. The recruitment, division of labour, continuing education, implementation of audit plans, and arrangement of work files belong to the category of implementation. The narrow sense of internal audit quality is relatively straightforward and specific, which generally refers to the evaluation of specific project audit results, including the monitoring and review of project - plan formulation - plan approval - plan implementation - audit report and a series of processes, as well as checking whether the audit work is able to be effectively run and if the audit results will be convinced [4].

2.3 Independence of internal audit

Independence is the necessary condition and prerequisite for the internal audit department to ensure the realization of its own value. Only the internal audit has high independence within the organization can it effectively protect the effective operation of internal audit mechanism and carry out objective inspection and supervision of the audit object. In this way, it makes the internal audit work obtain satisfactory results, so as to more effectively prevent and control the possible risks and management loopholes in the business process management. The independence of internal audit is mainly reflected through its affiliation and organizational status. To make the independence and objectivity of internal audit results and report ensured, the internal audit organization level must be higher than the audit object or the audit agency [5].

2.4 Transaction cost theory

According to the theory of transaction cost, internal audit cost saving effect is mainly reflected in the following three aspects: first of all, from the perspective of specific assets, it has specific asset applicable range limits and the transfer cost is high, which makes the application of specific assets confined to the internal product, thus creating an opportunity for the organization opportunism and the tendency and opportunistic behaviour. As a result, it results in the increase in the utilization cost, while the emergence of internal audit can check the violations and reduce the utilization cost. Secondly, from the perspective of uncertain environment, because the external environment risk that commercial banks are facing is great and difficult to predict, there is no possibility of zero risk. The internal transactions can effectively solve the incompleteness of the contract. The reason is that the internal organization does not need to modify the formal agreement, only needing to be in accordance with the requirements can appropriate adjustment be carried out for the protocol. Only the internal audit can independently and objectively supervise and check the internal transaction. With the increase of complexity and risk of external environment, the importance of internal audit in the organization is getting more and more recognition and attention. Thirdly, from the utilization frequency, the utilization frequency of specific assets is positively relevant with the organization internal development potential and demand. Only when there is greater demand can the establishment of internal organization is more productive for the investment of special assets; otherwise, the investment cost is greater than the internal audit cost savings, and then this investment will lose its efficiency and effect. Therefore, in general, the importance of internal audit is becoming more and

more important with the expansion of organization scale and the increasing frequency of internal transactions [6].

2.5 Internal audit scale

The scale of internal audit refers to the size of internal audit organization, and it can also be regarded as the amount of resources that can be obtained by internal audit and the allocation of resources, such as human, financial and material input to internal audit. The effective implementation of internal audit projects and audit plan of the commercial bank, there must be a sufficient number of internal auditors and a certain amount of funding for support and security. Only when the internal audit resources are guaranteed can we ensure a certain amount of human and material resources be invested into the internal audit work. Under the condition of enough internal audit department human resources and business support funds, the internal audit can conduct effective supervision and protection of the organization management and risk management. The fraud speculative behaviour of the management level can be timely detected and effective measures can be taken timely to make up for the loopholes in management [7].

3. Analysis on the quality of internal audit of commercial banks

3.1 Current status of internal audit quality of commercial banks

To ensure the independence of internal audit is the most important basis and guarantee of commercial banks to carry out the audit work. Only when the internal audit work maintains a high degree of independence and authority can it protect the internal audit work able to make objective and effective evaluation and supervision of the bank management and operation risk. Therefore, this paper analyses the independence of the internal audit quality of A-share listed commercial banks in three aspects: the membership status of the internal audit institutions of the commercial banks, the reporting route of the internal audit work, and the setting up of the internal audit institutions

Table 1 Establishment of 25 A - Share Listed Commercial Banks

Bank abbreviation	Internal Audit Coordinating Department	Membership mode
Industrial and Commercial Bank of China	Audit Committee	Board of directors
Construction Bank	Audit Committee	Board of directors
Agricultural Bank	Audit and Compliance Management Committee	Board of directors
Bank of China	Audit Committee	Board of directors
Bank of Beijing	Audit Committee	Board of directors
Minsheng Bank	Audit Committee	Board of directors
Bank of Nanjing	Audit Committee	Board of directors and board of supervisors
Pufa Bank	Audit Committee	Board of directors
Ping An Bank	Audit Committee	Board of directors
Industrial Bank	Audit Committee	Board of directors and board of supervisors
China Merchants Bank	Audit Committee	Board of directors and board of supervisors
Bank of Communications	Audit Committee	Board of directors
Ever-bright Bank	Audit Committee	Board of directors
Huaxia Bank	Audit Committee	Board of supervisors
Bank of Ningbo	Audit Committee	Board of directors
Bank of Changshu	Audit Committee	Board of directors
Bank of Jiangsu	Audit Committee	Board of directors and board of supervisors
Bank of Guiyang	Internal Audit Committee	Board of directors
Bank of Wujiang	Audit Committee	Board of directors
Bank of Zhangjiagang	Audit Committee	Board of directors

In practical work, because of the influence of the audit and audited unit information asymmetry, internal audit staffs often need to accept the leadership, report to and communicate with the executive. The internal audit often, as the management means for the management level checking the lower layer business departments, does not play principal-agent relationship supervision function and the supervision and evaluation of executive level has little effect.

Table 2 The work reporting line of the Listed Commercial Banks

Bank abbreviation	Reporting route
Industrial and Commercial Bank of China	The first reporting line: the internal audit branch → the internal audit bureau → the audit committee → the board of directors; The second reporting line: the internal audit branch → the internal audit bureau → the management layer / the board of supervisors
Construction Bank	The first reporting line: regional audit branch → audit bureau → audit committee → board of directors; The second reporting line: the audit bureau → President
Agricultural Bank	The first reporting line: the regional audit branch → the internal audit bureau → the audit and compliance management committee → the board of directors; The second reporting line: regional audit branch bureau → internal audit bureau → management layer / board of supervisors
Bank of China	The first reporting line: the audit department → the audit committee → the board of directors; The second reporting line: audit department – management
Bank of Beijing	The first reporting line: the board of auditors → the board of directors; Second reporting line: the audit department → President
Minsheng Bank	The first reporting line: the regional audit centre → the audit department → the audit committee → the board of directors; The second reporting line: the regional audit centre → audit department → board of supervisors / governor
Bank of Nanjing	The first reporting line: the directors' board of audit → the board of directors → the board supervisors audit committee → the board of supervisors; The second reporting line: audit department → management
Pufa Bank	Branch audit office → audit committee → board of directors
Ping An Bank	The first reporting line: the board of auditors → the board of directors The second reporting line: audit supervision department → top management level
Industrial Bank	The first reporting line: the regional audit branch → the audit department → the audit and related trade control committee → the board of directors; The second reporting line: regional audit branch → audit department → management level
China Merchants Bank	The first reporting line: the board of auditors → the board of directors; The second reporting line: audit management committee → President
Bank of Communications	The Audit Department of the provincial branch → the regional audit department → the audit committee → the board of directors
Ever-bright Bank	The first reporting line: the board of auditors → the board of directors; The second reporting line: the audit department → President
Huaxia Bank	The first reporting line: the directors' board audit committee → the board of directors and the board of supervisors → the board of supervisors; The second reporting line: the audit department → the board of supervisors / the president
Bank of Ningbo	The first reporting line: the directors' board audit committee → the board of directors and the board of supervisors → the board of supervisors;

	The second reporting line: the audit department → the board of supervisors / the president
Bank of Changshu	The first reporting line: audit and consumer rights protection committee → the board of directors; The second reporting line: the audit department → President
Bank of Jiangsu	The first reporting line: the board of auditors → the board of directors; The second reporting line: the internal audit department → President
Bank of Jiangyin	The first reporting line: the audit supervision committee → the board of supervisors; The second reporting line: audit department → President
Bank of Wuxi	The first reporting line: the board of auditors → the board of directors; The second report line: audit department management → supervision and examination level
Bank of Shanghai	The first reporting line: the board of auditors → the board of directors; The second reporting line: the audit department → top management level
Bank of Hangzhou	The first reporting line: the directors' board audit committee → the board of directors and the board of supervisors → the board of supervisors; The second reporting line: audit supervision department → top management level
Bank of Guiyang	The first reporting line: the board of auditors → the board of directors; the second reporting line: the audit department → the general bank
Bank of Wujiang	Audit department → audit committee → board of directors
Bank of Zhangjiagang	The first reporting line: the board of auditors → the board of directors; the second reporting line: audit department → board of directors

As a branch of the commercial bank has the unique feature of wide breadth and multiple numbers. China's A shares listed commercial banks, in addition to the establishment of the audit department in the head office, also sets the branch of the internal audit agency. It is generally divided into two cases, one is a regional division of the establishment of Audit Centre, and the other one is to set the audit branch with the subsidiary bank as the unit.

3.2 Problems in the internal audit quality of commercial banks

Lack of professional competence for internal auditors: the commercial bank internal audit staffs have received professional training held in organizations, but most with occasional training, and regular training proportion is very low. The most direct consequence for low frequency is that the quality of professional internal audit staff of commercial banks cannot keep up with the varying internal audit and financial environment.

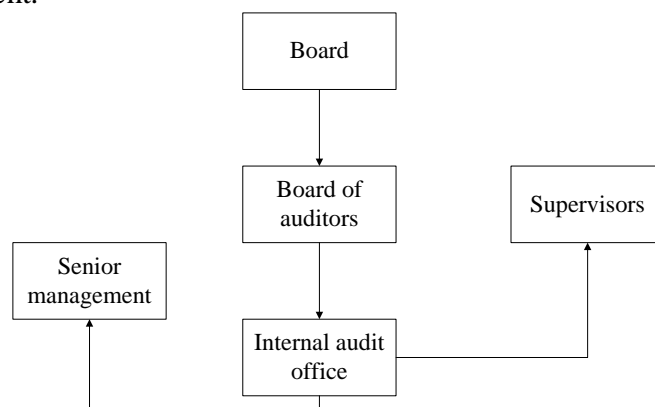


Figure. 1 Bank internal audit branch setup

Table 3 The training frequency of the internal auditors of commercial banks

	Half a year	Annually	Training irregularly	Never training
Training frequency	0%	10%	90%	0

Only a small part of the commercial banks arranged the work shift system for internal auditors and the majority of commercial banks did not perform the job shift system. The internal audit staff engaged in regular work for a long time, which easily led to rigid work thinking and weak innovation consciousness.

Table 4 The work shift frequency of internal audit staff of commercial banks

	One year and below	One to five years	More than five years	Irregular	No work shift
Work shift frequency	0%	6%	0%	12%	82%

The auditor work shift frequency is not high, the personnel lacks flow, internal audit staff is separated from the front business, and they engaged in a single and fixed audit work, which is easily to lead to rigid thinking. As a result, the understanding of other business category within banks is insufficient, even do not know or do not know fully on some major issues reform and changes in business processes. The lack of professional advantages and shortcoming of information asymmetry makes part of the auditors difficult to fully determine the capacity of difficult problems and sensitive issues in the audit process. It results in that the internal audit staffs find the possible key risk points in the audit process, thus affecting the quality of supervision and evaluation of internal audit. In addition, most commercial banks have not established the regular professional training system of internal audit staff. The breadth and depth of audit staff training and follow-up education professional learning have certain limitations, leading to the business operation out of touch with management in the internal audit in different extents. Coupled with new business rules constantly updating, internal audit staff stay in the narrow area for long term, the view is closed, and new knowledge is updated not timely. As a result, it cannot establish modern innovation audit consciousness keeping pace with the times. Thus, it is difficult to cope with new challenges for the internal audit of commercial banks brought by constantly developing innovative financial business environment.

Inadequate scale of internal audit: the scale of internal audit refers to the size of internal audit organizations, or the number and financial status of internal auditors. Internal audit can obtain resources and objectively reflect the scale status of organizational institutions. This paper analyses the two aspects of personnel scale input and economic scale input.

Scale of personnel input: the scale of the audit committee: in 2016, China Banking Regulatory Commission (CBRC) issued the Notice No. twelfth on Issuing the Guidelines for Internal Audit of Commercial Banks (hereinafter referred to as "notice"), and put forward rigid requirements for the number of audit committees and the number of internal auditors in commercial banks. The notice is in the second chapter, the ninth provision of organizational structure. Banking financial institutions should establish an independent and vertical internal audit system. The board of directors shall have an audit committee, and the audit committee shall not be less than 3 staffs. The chairman of the board of auditors shall be held by an independent director. Through access to relevant A shares of listed commercial banks in the 2010 - 2015 annual report, we collected 9 commercial banks that have disclosed the number of audit committee staff. From Tables 3-8, it can be seen that, commercial banks are in accordance with the requirements of CBRC guidelines for internal audit of commercial banks, and the number of audit committee is arranged for more than 3 people. In 2010, 2011 and 2012, the number of the audit committee of China Bank even reaches as high as 8, which shows that from the commercial banks having disclosed relevant information, the audit committee size can basically meet the requirements of the specification. But there are still about 2/3 of commercial banks does not disclose the size of the audit committee, which also reflects the blind area of scale management and control of audit committee for commercial banks in a certain extent.

Table 5 The scale of the audit committee of commercial banks

	State-owned Listed Commercial Banks				Joint-stock Commercial Banks				
	Agricultural Bank	Bank of Communications	Industrial and Commercial Bank of China	Construction Bank	Bank of China	China Merchants Bank	CITIC Bank	Ever-bright Bank	Minsheng Bank
2011	4	4	7	7	8	5	7	5	6
2012	5	4	7	5	8	5	7	5	6
2013	5	4	7	6	8	5	7	5	6
2014	6	5	7	8	7	5	6	5	6
2015	5	7	7	5	7	5	5	5	6
2016	6	7	7	8	7	5	3	6	5

Scale of economic investment: because of the internal audit data hiding feature, we cannot obtain the funds' investment amount of internal audit of commercial banks. But through the comparison of internal audit with external state audit and social audit, we can see the limitation and restriction of internal audit funds scale investment. As shown in Figure 2, the state audit fund is guaranteed by the state finance, social audit funds are supported by independent audit income, and internal audit fund is a part of the organization management cost. The funding source has no strict rules, which depends largely on the arrangement and decision of management layer. However, in that the internal audit work in essence is directly related to the management own interests, if management's own interests are restricted and threatened by the internal audit work, the limitation of executives for internal audit funds is difficult to avoid. But not enough funds scale investment will be a direct result of the internal audit work hard and it is difficult to effectively play its role, eventually leading to difficulty in improving the quality and efficiency of audit in commercial banks.

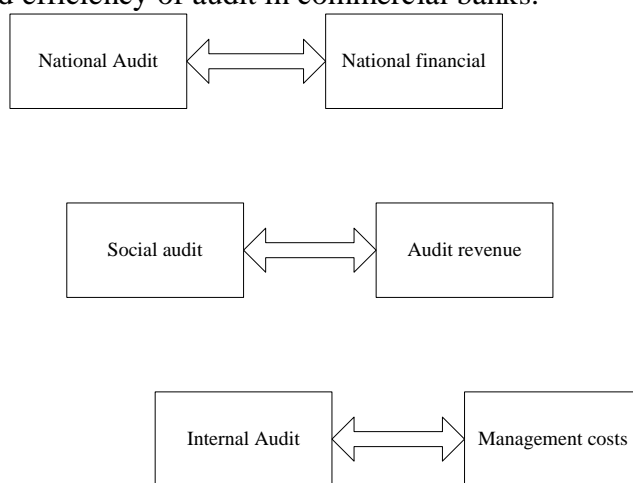


Figure. 2 Comparison of internal audit economic input and external audit

Limitations of internal audit duties: the first limitation is the scope of internal audit work. In general, the responsibilities of the internal audit of commercial banks should include: evaluation of risk identification and the effectiveness of assessment and management; assessment of the validity of internal control system and verification of internal control evaluation system operation mode; investigation on abundance of banks for elated policy and control of risk; evaluation of security of information system as well as adequacy and effectiveness of the information technology control activities; confirmation of the authenticity, accuracy and completeness of the financial and operational information management; implementation of board or audit committee required special audit work. But for a long time, for a number of strategic, policy and social issues, China's commercial banks internal audit has not been given due attention and the scope of internal audit has limitations.

The second limitation lies in the technical methods of internal audit: China's commercial banks are relatively backward on the information system internal audit mechanism, internal audit technical

method and business processing method. Especially the information technology and electronic audit experts are very scarce, internal audit methods and information technology are difficult to meet the requirements of online business and the development of information. Although most of the listed commercial banks have completed the basic construction of the internal audit information system, the application of the information system in commercial banks is merely in the stage of information collection and process management. Therefore, relying solely on information internal audit platform is simply unable to meet the actual needs of internal audit. We must make modern information and internal audit perfectly cooperate and work together to maximize its effectiveness.

4. Results and discussion

Based on the above literature review and theoretical analysis, the commercial banks internal audit independence, internal audit staff professional competence, internal audit institution scale and internal audit responsibility scale four factors are taken as the main indexes to measure the quality of internal audit in commercial banks. The various characteristic factors are investigated, analysed and evaluated:

Table 6 The evaluation of the comprehensive index of the professional competence of the internal auditors of the Listed Banks

Interval	1.37-1.51	1.52-1.65	1.66-1.79	1.80-1.93	1.94-2.09
Value	1	2	3	4	5

It is expressed by the number of branches of commercial banks. Because commercial banks' internal audit information disclosure has considerable limitations, the number of staffs in the internal audit departments and the amount of investment cannot be obtained, it can only be replaced by similar variables instead.

Table 7 The evaluation of the comprehensive index of the internal audit institutions of the Listed Banks

The number of branches of the Listed Commercial Banks	80-7947	7948-15814	15815-23682
Scale of internal audit	1	2	3



Figure. 3 An internal audit system diagram of a bank

The effect of external audit on the quality of internal audit of commercial banks is not significant whether it uses the international "four major" accounting firms. This is inconsistent with the hypothesis proposed in this paper, which indicates that the external audit of commercial banks in China have a single and limited role and responsibility. They have not yet established an effective mutual support relationship with the bank's internal audit. There should be a relationship between the directivity of the coordination of internal audit and external audit in commercial banks in the process

of governance, so as to promote the organic combination of the two and the interaction. The asset size of commercial banks has a significant positive impact on the quality of internal audit of commercial banks, which is consistent with the expected results in this paper. It shows that commercial banks with larger asset size pay more attention to the improvement of the quality level of internal audit of the banks.

5. Conclusion

Facing the new economic environment changing rapidly, internal audit is playing an increasingly important role in internal governance and risk control of commercial banks in China. The quality of internal audit is closely related to the healthy and stable development of commercial banks. Therefore, the research on commercial banks internal audit has very high research value and significance. The perfect theoretical basis and system construction can have a positive impact on the quality of the internal audit of commercial banks. Further establishing and perfecting the theoretical system of internal audit of commercial banks is of great importance for guiding the internal audit of commercial banks and improving the quality of internal audit of commercial banks.

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