Research on Internal Audit Model of Banking Construction Based on XBRL Financial Report

Lingyan Zhou

School of Accounting

Fujian JiangXia University

Fuzhou, China 350108

Abstract—**The current XBRL technology has been widely used in commercial banks in China. The continuous development of banking information system has brought great challenges to internal audit work. In the XBRL information data environment, the internal audit model of commercial banks should be built based on XARL language, encryption and data mining technology, so as to realize diversified dynamic analysis of data information, timely discover potential risks and achieve continuous real-time audit.**

Keywords—financial industry; XBRL; internal audit; XARL

I.   INTRODUCTION

Extensible Business Reporting Language (XBRL) is a computer language that enables financial information to be transmitted and exchanged over the network. It is the latest technology for processing accounting information, enabling the integration and maximization of financial data. China's Shanghai Stock Exchange and Shenzhen Stock Exchange started the XBRL pilot in 2004. In 2005, Shanghai listed companies were required to submit XBRL format annual reports, becoming the first country to mandate XBRL network reports. After more than ten years of exploration, the XBRL project has achieved initial success in China. The XBRL network financial report has become the mainstream of the current banking accounting information disclosure form, but it also poses a challenge for commercial banks' internal audit. The internal audit work of the banking industry is transformed from experience dependence to data dependence. The audit mode changes from sample on-site audit to intelligent off-site audit to realize diversified dynamic analysis of data information. Therefore, the banking industry needs to establish a set of internal audit work procedures based on the XBRL data information environment.

II.   THE ADVANTAGES OF XBRL

By following existing accounting standards and practices, the availability of existing accounting standards is enhanced through XML language, making analysis and exchange company financial reporting and other information easier and more reliable. As an emerging advanced technology, XBRL has the following technical advantages. First, the data in the XBRL-based financial report is a more efficient, accurate, and relevant search mechanism for financial information

users by marking the content and structure. Second, because XBRL financial reports are compiled based on classification criteria approved or endorsed by XBRL International, they can be exchanged and processed without amendment. And its scalability is good; companies can define the required information elements according to their own needs. Third, XBRL is an independent technology platform that further enhances data translatability. Fourth, the XBRL information can be used once for multiple times, and the different reports required by different information users can be electronically formed. This has driven paperless financial reporting and data reduction operations, reducing the cost of preparing financial and regulatory information to some extent. Fifth, XBRL files can be parsed and edited, so XBRL documents can be converted into different formats, such as web pages and spreadsheets and database software data files. XBRL data can be displayed in the station browser, transmitted to the database, transmitted to the printer, and created with other XBRL documents. Sixth, XBRL enhances the analysis of financial information of enterprises, and users can analyze and obtain financial data of several companies at the same time. The financial report based on the XBRL language brings great convenience to the readers and monitors of the report. It can be used across platforms and is not limited by computer systems. XBRL's international technical specifications and language standards can be used free of charge. Anyone can log in to the system at any time according to their needs and call XBRL information without paying any fees.

III.   BANKING XBRL NETWORK FINANCIAL REPORTING RISKS

Although XBRL has the above advantages, XBRL does not guarantee the reliability and integrity of financial information. Banking XBRL financial reports have many shortcomings.

A.   *There Is No Guarantee That the Taxonomy Will Be Properly Used*

The taxonomy is a document that describes key data elements and is a core element of XBRL. It defines the relevance, location, and name of each financial statement element, and also reflects accounting standards. The development and implementation of the XBRL taxonomy is

related to the accuracy of the financial statement subjects and amounts. The classification criteria were developed to reflect the rules used to report financial reports to investors, regulators, etc., but XBRL itself does not guarantee that the taxonomy used in creating XBRL reports is appropriate. In order to improve the quality of XBRL financial reporting in the financial industry, China promulgated the "Financial Classification Standards" in 2009, and in December 2011, the Bank Expanded Business Reporting Language (XBRL) Extended Taxonomy. At present, the implementation of the classification standard is still in the initial stage, and the application effect needs to be tested. Auditors who need to understand specific financial accounting reporting requirements and classification standards should check the classification standards used by the audited XBRL instance documents and check whether the used classification criteria are consistent with the classifications to verify that the expanded classification meets the requirements of the XBRL specification.

B. The Tag Describing the Classification Element Is Misused

In the case of using XBRL to prepare financial statements, the error risk is not only focused on the proper use of the taxonomy, but also whether the accounting subject can be correctly mapped to the corresponding mark. The exact mapping of the tags will ensure that the retrieved data is imposed. If there is an error in the mapping, this is no different from the error in the retrieved data itself. When financial information flows in real time, the risk of errors in financial statements will multiply, depending on the control of data changes and the control of the data tag mapping process.

C. Technical Issues

The XBRL platform function has not been fully opened. Both cities encourage listed companies to submit XBRL financial reports. However, the XBRL platform only implements a simple comparison of XBRL financial data. Some personalized functions are not reflected, such as automatic exchange and excerpt of financial information, information on demand. In addition, XBRL does not restrict anyone from editing and using electronic financial information. Since the XBRL language is composed of program code, the program may be modified, and the third party maliciously attacks the tampering data, thereby affecting the reliability of the XBRL instance document and reducing the efficiency audit work.

D. The Accuracy and Completeness of Financial Information Is Yet to Be Verified

Both cities' XBRL platforms affirm that "the information disclosed in the XBRL instance document is for reference." Accounting [2014] No. 9 stated that "the relevant enterprises are exempt from accounting responsibility for their XBRL financial reports, and relevant accounting firms and certified public accountants are exempt from auditing responsibility". These exemptions make XBRL submitters not necessarily in XBRL format. The quality of the information reported is

guaranteed. In addition, the users of current XBRL data information are mostly external information users, and the data reporting enterprises have the obligation to submit, failing to enjoy the benefits of reducing the cost of information exchange and improving the efficiency of statement preparation. Such rights and obligations are not equal. It also causes XBRL submitters not to care about the accuracy and completeness of financial information. Commercial bank XBRL financial reports often have missing items. This poor XBRL financial information will greatly reduce the audit effect and easily lead to deviations in information screening results.

IV. THE IMPACT OF XBRL ON THE INTERNAL AUDIT MODEL

A. Impact on Audit Scope

The internal audit is implemented by embedding the audit program in the XBRL system. In addition to the traditional financial audit content, the auditor should also analyze the acquired non-financial information. In addition, it is necessary to pay attention to whether the XBRL instance document is consistent with the XBRL technical specification. Whether it conforms to the XBRL taxonomy and whether the data elements are fully mapped to the acquired financial reports. At the same time, another internal audit should focus on the soundness of the company's internal control system, whether it can provide a sufficient and rigorous environment for the implementation of XBRL, ensure the accurate exchange of relevant financial and non-financial data, and be recorded in the appropriate accounting period. The internal auditing assurance center will be extended to the development and design of XBRL, the proper use of the XBRL taxonomy, the security and reliability of the XBRL system environment, and the soundness of the internal control system. Auditors need to spend more time and energy to understand and review the functions of the XBRL system. In addition to auditing the information systems after they are put into use, they should also conduct pre- and inter-inspection of the system during the design and development phases of the system.

B. Impact on Audit Function

In the XBRL environment, auditors can provide reporting-related consulting services and information-related certification services based on traditional assurance functions. The attestation service includes auditing, agreed procedures, and review content. In addition to the attestation services, the certification services also provide system reliability certification, WEB certification, risk assessment, and corporate performance evaluation. Certification services are a service that improves the quality of financial and non-financial information used by decision makers and can help people make better decisions by improving information.

C. Impact on Auditing Methods

In the past, due to incompatibility between databases, auditors still need to manually enter data during audits, which increases audit work time and workload. In the XBRL

environment, XBRL is compatible with different software and can be easily run on different system platforms. Auditors do not need to spend a lot of time to convert financial reports in different formats. Compared with traditional auditing, auditors are more likely to obtain financial data and non-financial information, and analyze and process the collected data by embedding the program that performs the audit function in the XBRL system. Moreover, once the XBRL data is created, it does not require a second processing to be converted into any special reporting method, which reduces the error rate that can occur by manually inputting data. The use of XBRL greatly facilitates data integration, reduces audit costs, and improves audit efficiency. The auditor can spend more time on the analytical review of the audited entity to improve the speed and accuracy of the analytical review.

D. Impact on Audit Risk

XBRL is an Internet-based financial report. In the process of continuous auditing, the transmission of data information is vulnerable to malicious interception, tampering, etc. by third parties, affecting the accuracy of enterprise data and even leaking corporate information. The expansion of the scope of internal audit has put forward higher technical requirements for auditors, and it requires a combination of computer network and audit knowledge. Because the auditors in our country still lack the compound auditing talents, the auditors are likely to be unable to discover the abnormalities of the XBRL system environment due to the limitations of their own technical level, thus making inappropriate audit conclusions and affecting the decision-making of information users.

E. The Possibility of Implementing Continuous Auditing

With the wide application of XBRL technology, the financial information of enterprises often realizes online real-time disclosure. The traditional post-event audit mode can no longer meet the demand, and continuous auditing becomes possible. In the ongoing audit process, all transactions and activities of the company can be periodically reviewed and continuously monitored, and the system can automatically control and risk assessment. Continuous auditing is a higher-level application of audit technology development. In the process of continuous auditing, it is possible to find abnormalities and collect audit evidence in the very short time after the business activity occurs or after the occurrence of the audit, so as to judge the audited matter, the audit results can be obtained by means of an automated program system at the same time as or after the occurrence of the audited matter. Continuous auditing is achieved by embedding auditing modules in the XBRL system. Compared with traditional internal auditing, continuous auditing is more objective and avoids the risk of information leakage caused by external auditing. Because of the XBRL technology system that continuous auditing, it can not only process quantified data, but also identify non-quantitative information, reflecting the broad characteristics of continuous auditing. It can be seen that continuous auditing is more advanced than traditional auditing methods, and it

has a positive effect on the improvement of audit effectiveness and the improvement of audit quality.

V. APPLICATION CONDITIONS FOR THE IMPLEMENTATION OF CONTINUOUS INTERNAL AUDIT MODEL

A. Network Environment Requirements for Data Transfer

To ensure the normal operation of the continuous audit model, a secure network environment is required. Since the XBRL network financial report is transmitted on the network, especially between the various entities, if the security of the network environment cannot be guaranteed, the audited unit, the audit institution, and especially the accounting information users will cause serious problems. At the same time, the smoothness of the network environment is also one of the necessary conditions. Only a smooth network environment can guarantee the realization of continuous auditing, and can meet the timeliness requirements of accounting information, and provide efficient and fast services for accounting information users.

B. Information System Reliability Requirements

In the model of continuous auditing, the security and smoothness of the network environment can only guarantee the unrestricted transmission of financial information, and the stability of the software system of each enterprise, the reliability of the auditing system, and the compatibility of the data modes of each system are not up to When it comes to requirements, continuous auditing is also ineffective, unable to play its own important role or even impossible.

C. Auditor's Comprehensive Quality Requirements

After the implementation of the continuous audit mode, the overall quality requirements for auditors will be improved, not only must have financial knowledge, but also the basic knowledge of network information systems. Auditors should be able to identify and effectively deal with information security issues, be able to find misstatements, miss financial information, and conduct internal control testing and evaluation of real-time accounting information systems.

VI. BANKING BASED ON THE CONSTRUCTION OF CONTINUOUS INTERNAL AUDIT MODEL IN XBRL ENVIRONMENT

A. The Logical Starting Point for the Construction of a Continuous Internal Audit Model

Referencing XBRL technology is the logical starting point for the entire model building. In the technical framework of XBRL, there are two levels of XBRL_GL and XBRL_FR classification standards, XBRL_GL is used to regulate the original data and ledger at the transaction level, and XBRL_FR is used to regulate financial report related information. Due to the promulgation and implementation of the "Classification Standards for Financial Companies" in China, the data interfaces of financial enterprises have been standardized. At the same time, XBRL has unified labeling

of financial reporting elements and ledgers, which solves the grammar problem, which enables the auditing system to automatically identify all reporting elements and drill down to the underlying database to check the ledger and even the accounting vouchers. Through this function, a large number of statistical analysis experience models built in the audit system and automatic execution of the expert knowledge base are made possible.

B. Continuous Internal Audit Content of the Banking Industry

The continuous internal audit of the banking industry includes:

1) Audit of the XBRL taxonomy: Different companies must comply with the XBRL taxonomy and must extend the taxonomy according to the company's unique business handling practices. Although China has promulgated the "Classification Standards for Financial Companies", it allows each company to expand the classification criteria according to its own needs. Internal auditing needs to use the classification standard as one of the audit contents.

2) Audit of the information system development process: Through the audit of the whole process of the system development and the results of the internal control, development procedures ensure that the system does not have loopholes in the processing and storage of data.

3) Audit of internal control of information systems: The correctness of the processing results of the information system depends more on the improvement of the internal control system. Auditing the internal control of the enterprise information system can not only determine the scope and focus of the audit of the data files, but also strengthen and improve the internal control system.

4) Audit of information system operations: Internal auditors need to review the rationality of bank staffing and the compliance of manual operations to ensure the policy operation of the information system.

5) Audit of XBRL instance documents: In addition to identifying the specific economic issues in the XBRL financial report, the XBRL classification criteria and labels are also identified. When expanding new elements, it is also necessary to check the correctness of their classification and whether the classification criteria are strictly in accordance with XBRL technical specifications and guidelines.

6) Accounting information: The audit department conducts internal audits of the bank's business information, including financial information and non-financial information.

C. Banking Continuous Internal Audit Related Subjects

The bank's continuous internal audit mainly involves three data subjects: information demander, audited object, and internal audit department.

1) Information demanders: The information demander is the starting point of the bank's continuous internal audit

based on XBRL and the end point of the entire financial information flow. The bank's XBRL-based continuous internal audit is driven by the real-time demand for information from senior management. The internal audit department needs to evaluate and review the authenticity and integrity of the data to ensure that information users make decisions based on this information.

2) The object being audited: The bank's head office, branches, sub-branches and various departments are audited, and these departments are responsible for entering, collecting and transmitting basic financial information. Due to the driving and real-time nature of XBRL technology, real-time continuous internal auditing is realized, which guarantees the accuracy of XBRL instance document data and strengthens the timeliness and effectiveness of bank management decision-making.

3) Internal audit department: The internal audit department is the core body of the continuous internal audit model. It has the functions of evaluating the information system of the audited object, evaluating the internal control of the test, auditing the financial information in real time, and submitting the audit report to the manager.

D. Key Technologies for Building XBRL Continuous Internal Audit

Extensible Verification Audit Reporting Language (XARL) is a language based on XML that defines the reliability of financial and non-financial information disclosed by XBRL by defining a digital language and relying on an accredited attestation process and security technology. An XARL document contains special tags that indicate the type of verification, the date of verification, the digital signature of the auditor, etc., and the user can easily identify the source of the information.

Data mining is the process of discovering interesting knowledge from large amounts of data stored in databases, data warehouses, or other repositories. Data mining systems have several main components of database or data warehouse, database or data warehouse server, knowledge base, data mining engine, pattern evaluation, and user interface.

To enhance data security during XBRL instance document delivery. The important data is garbled (encrypted) by appropriate key encryption technology. After reaching the destination, the receiver of the information is restored (decrypted) by the same or different means, and converted into the original information before encryption. The encryption technology consists of two elements: algorithm and key. The algorithm is a combination of ordinary text and a string of numbers (keys) to generate an incomprehensible ciphertext. The key is used to encode and decode the data. Data encryption technology has two aspects: one is the data security technology, and the other is the true and complete verification of the data. The financial report audit information in XBRL format contains the original data of the enterprise and involves a large number of business transactions. Therefore, the audit department and the audited

entity can use asymmetric encryption technology to ensure the confidentiality of the data transmission process. This measure can be effective. Prevent the risk of financial confidentiality disclosure.

The current XBRL continuous audit research models mainly include embedded continuous audit model and agent continuous audit model. The embedded continuous audit mode embeds the continuous audit system into the information system of the audited entity, which will affect the system stability of the audited entity and bury hidden information security risks. The agent technology is that the auditor inputs the instructions to the data agent through the Internet to start the auditing process, continuously monitors the stand-alone system of the audited entity, extracts relevant data information, and stores it separately, and then compares it with the continuous auditing classification standard. If an abnormality is found, it will automatically alarm, and the auditor will intervene for manual review. Compared with the embedded technology, the proxy technology does not occupy the system resources of the audited entity, ensuring the stability of the banking data network and the smooth flow of data.

E. Construction of a Continuous Internal Audit Model in the Banking XBRL Environment

Considering the above factors, in the XBRL information data environment, based on the required technical means in the continuous internal audit model, based on the proxy audit mode.

When every business occurs in a commercial bank, the information collected by the information system is filtered out by data mining technology, and the remaining information data is further summarized, classified, organized, and stored in the general ledger. In a database such as a report, an XBRL instance document is formed periodically. After receiving the internal audit order, the audit department issues a data request to the accounting information management system of the commercial bank to retrieve the required accounting information.

The audited object encrypts the XBRL instance document by using encryption technology and digital signature technology to ensure that the data is not tampered and intercepted during the transmission process, and is sent to the internal audit department through the Internet platform.

The internal audit department decrypts the encrypted XBRL instance document, verifies whether the third party maliciously tampers with the third party, ensures the integrity and authenticity of the received XBRL instance document information, and the received XBRL instance file forms an internal Audit database.

Internal auditors select representative data from the audit database to use the XBRL simulation program for consistency check, check whether the XBRL taxonomy is compliant, analyze the appropriateness of the specific industry taxonomy adopted by the bank, and the security mark of the XBRL connection. If the analysis results are different from the results displayed in the XBRL financial report, the XBRL taxonomy and markup are misused and the data may not be available for auditing. The system will issue an early warning to the online audit center, which requires audit staff to review and ask the audited object to resend the audit information data. If the analysis results are the same as those displayed in the XBRL financial report, the generation of the XBRL information data is accurate and reliable.

If an abnormality is found, the system will issue an early warning to the online audit center. The internal auditor will judge the abnormal situation. If the abnormal situation is true, it will be reflected in the audit report.

The XBRL instance document is authenticated and XARL is matched to generate XARL audit report, and digital signature and encryption are generated. This generation method is not limited to one item in XBRL financial report, but can be used for the entire financial information system. The internal control system of the audited entity is matched to audit the XBRL information. Then the encrypted XARL document is transmitted to the user, and then the corresponding XARL document is converted into a standard audit report to the information user. The formed XARL document has various text forms such as HTML and PDF, and can be read by various systems.

VII. APPLICATION OF CONTINUOUS INTERNAL AUDIT MODEL BASED ON XBRL ENVIRONMENT IN BANKING INDUSTRY

A. Banking Industry Based on the Implementation Process of Continuous Internal Audit in XBRL Environment

The purpose of the preparation phase is to determine the scope of internal audit, key audit areas, and develop a comprehensive audit plan to fully prepare for the implementation of internal audit work. The preparation work should include:

- understanding the integrity and accuracy of the bank's XBRL specifications and classification standards, network structure and security status, as well as understanding the relevant audit information of the information system development process;

- identifying key audit areas Rationally allocate audit resources and make appropriate assessments of the level of importance to determine the low level of acceptable audit risk;

- preparing audit plans to coordinate the implementation of audit work. Including the scope of the audit work, steps, time schedule, division of labor, precautions and other content that should be concerned.

The internal audit program center based on the XBRL environment has shifted, focusing more on the verification and evaluation of accounting information systems and internal control procedures. The real-time monitoring of the audited data information is realized by implementing the set early warning indicator. The alarm system is automatically triggered for the abnormal domain or the exception and

stored in the early warning database, waiting for the auditor to manually process. The work at this stage includes: 1 control testing. Control tests under XBRL technology include control of real-time financial reporting, integrity testing of controls and marking methods to ensure proper use of taxonomies, and substantive testing of transactions and account balances. As with traditional auditing, the substantive testing of continuous internal auditing based on the XBRL environment also tests the correctness of the bank's various transactions and account balances as well as the authenticity and integrity of financial reporting and business processing.

XBRL-based continuous internal audits produce audit reports for a short period of time and are highly time-sensitive. After issuing a continuous internal audit report, the auditors should regularly and timely test the audit conclusions, including tracking the rectification situation and providing timely feedback to ensure the security and authenticity of the data information during the continuous internal audit process.

B. Banking Industry Based on the Advantages of Continuous Internal Audit Application in XBRL Environment

Commercial banks have a large number of institutions, and their business is diverse and diverse. This may result in the need to transcode the data between different commercial banks and branches, and convert it into data that both systems can accept and process. This process is inseparable from manual processing, which inevitably results in data conversion costs. Using the XBRL language, after the data information is entered, the data file can be marked and an instance document can be generated, which realizes that the information is used for multiple times. For the audit work, the time for data secondary processing can be saved, and only the original data needs to be audited to meet the information demand of the audit work. The XBRL taxonomy is extensible, and the banking industry can define its own information elements according to its own needs, so that the generated instance documents contain more comprehensive information. At the same time, the XBRL instance document can be processed by itself and selected as the output text form, which is read by different system software. Different data users can selectively read the data information they need according to their own needs, saving the data. Data conversion technology costs. In the continuous audit mode, auditors use the computer system to view data and use the underlying database for analysis, which reduces audit labor costs and reduces audit errors.

The internal audit model based on XBRL environment not only audits the business data information processed by the information system, but also includes the classification standards and labels of XBRL, the correctness of the extended classification standards, whether the classification standards follow the XBRL technical specifications, and even the entire information system is also subject to audit. Only by ensuring the stable and efficient operation of the information system, internal auditors can correctly audit the XBRL instance document content in order to identify and

assess risks. Internal auditors need to understand the structure of the bank's entire information system, and to check whether all kinds of software and hardware facilities are safe and reliable, and whether security measures are in place during the transmission of information data, so as to evaluate whether the information system can operate effectively and whether it can be XBRL documents. Proper establishment, transmission, modification, etc. provide platform support.

In the traditional continuous internal audit process, when abnormal items are found, it is necessary to extract relevant data of abnormal items and track the original information of the matter, which requires a lot of labor time. In the context of XBRL, every transaction of the bank is entered into the database at the time of the transaction. The original data will be stored in the financial management database and various real-time financial statements will be generated in a short period of time. In this process, the speed at which the financial personnel confirm, measure, and record the data is greatly improved, thereby reducing the risk of errors in the data entered by the auditor. On the other hand, auditors can spend most of their time on the verification of banking data, and increase the analysis and review procedures for banks, thus discovering major misstatements and underreporting, achieving continuous audits, and reducing audit risks. Applying the information obtained by the XBRL platform can quickly track the original information source, which can meet the needs of the audit work for information data.

Continuous auditing in the context of XBRL is achieved by embedding auditing modules in the XBRL system. Auditors can pay more attention to biased analytical testing and review procedures, effectively reducing the risk of continuous auditing and checking risks. In addition, the conversion of audited data no longer requires multiple ports to compile multiple modes, and conversion can be realized only through XBRL technology, which greatly reduces the risk of data conversion for continuous auditing.

VIII. CONCLUSION

XBRL network financial reporting will become the common reporting language of global finance. Combining XARL language with XBRL language can reduce the cost of explaining information reliability for commercial banks, and it is easier for information users to judge finance. During the implementation of continuous internal audit, attention should be paid to the evaluation of internal control and real-time internal control testing. While ensuring the operational efficiency and quality of the bank information system, an audit report process should be established to ensure the discovery of the internal audit process. The problem can be answered in time. In addition, because China's XBRL language is in the early stage of development, many labeling languages are constantly improving. There are few researches on XARL technology. It is necessary to strengthen the development and application of continuous internal audit technology resources. It requires the cooperation of computer network engineers and CPAs.

REFERENCES

[1] Zheng Yan, Niu Yanfang. XARL — Discussion on Accounting Language Related Issues Providing Verification Information [J]. Journal of China Management Information, 2008(17): 6-9.

[2] Mark O'Neil. Web Service Security Technology and Principle [M]. Beijing: Tsinghua University Press. 2003.

[3] J E Boritz and W G No. Assurance Reporting for XML-Based Information Services: XARL [J]. Canadian Accouting Perspectives. 2004 (3): 35-37.

[4] Plum lee R.D. Plum lee M, A.Assurance on XBRL for financial importing [J]. Accounting Horizons.2013(22): 353-368.

[5] Boritz J. E., Won G. No. Security in XML-based financial reporting services on the Internet. [J]. Journal of Accounting and Public Policy. 2014 (24): 27-35.

[6] Cruz, Marivic, D.M, Adoptiing Extensible Business Reporting Language (XBRL): A grounded theory [D]. University of Phoenix. 2012.