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Risk Management Capacity at Banks: Study at Vietnam Commercial Banks

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Abstract
The financial market has many risks, so risk management and improving risk management capacity are always the top concerns in the operations of commercial banks. In addition, globalization and the increasing innovation of the banking system are making the activities of the banking system in the world and in Vietnam increasingly risky and complex. The Industrial Revolution 4.0 has affected all economic activities globally. It brings many important technology applications that facilitate the process of monitoring and managing risk in the fields of finance and banking. The transformation in the banking system applying technology has posed significant challenges in operating the use of technology, personnel, etc. The article adopts a systematic, qualitative method to analyze the types of risks, points out the current status of risk management, and proposes a number of solutions to improve risk management capacity to help commercial banks operate their businesses effectively and safely.

Keywords: Risk Management, Commercial Banks, Industrial Revolution 4.0

1. Introduction

During their existence, commercial banks always have to deal with many problems, the most important of which is to regularly maintain a balance between needs and the ability to obtain capital in all conditions. Conditions to ensure financial stability and solidity for commercial banks and meet customer needs well. To do so, bank administrators cannot help but focus on risk management when wanting to maximize profits and come up with measures to minimize losses for commercial banks. In fact, banking risk can appear in all operations of commercial banks, such as payment, credit, deposits, foreign currency, investment, etc.Therefore, the issue of banking risk is that commercial banks in developed countries always pay special attention to research and analysis, even when the economy is very stable.

Regarding the increasing impact of risks on the financial market, one of the pressing issues of commercial bank management today is risk management, using different measures to determine the level of risk. Predict the level of risk that may occur in operations and provide solutions to minimize the level of each type of risk. The method of identifying and assessing risks must regularly change accordingly because it involves many factors, including those arising from the commercial bank itself and external factors. Adjustment ability of commercial banks. Through the risk management system, the goals and tasks of commercial banks' development policies are clearly reflected.

The 4th industrial revolution has brought many important technology applications to the economy, such as robotic processing systems, natural language processing, artificial intelligence and machine learning models, augmented virtual reality, voice and facial recognition technology, big data, and machine learning. These technologies have had a significant impact on the finance and banking sectors in many aspects, including: the process of horizontal connection of smart systems; the process of vertical integration of value chain networks; the use of engineering throughout the entire value chain; and accelerating through breakthrough technologies. This transformation entails major changes in risk and risk management in the commercial banking system.

2. Literature Review

According to popular understanding, risks are events or possibilities that cause material or immaterial losses or even financial disasters for banks. According to Pyle (1997), risks are often divided into primary and secondary groups. The group of main risks includes: market risk (changes in net asset value due to changes in basic market conditions such as interest rates, exchange rates, equity, and commodity prices); credit risk (change in net asset value due to change in capacity of parties involved in the contract); operational risk (costs arising from violations leading to insolvency or failure to meet regulations on time); and implementation risk (losses due to failure to properly supervise employees or lack of adoption of reasonable solutions, also known as model risk). Among these 4 main risk groups, in finance, the first 2 types of risks are mentioned and discussed more often than the last 2 types.

Risk management is the process by which managers meet needs by identifying key types of risk, applying operational risk measures, and building a system of work to monitor risk positions. risk results (Pyle, 1997).

According to the handbooks or professional handbooks of commercial banks, risk management is often defined as the process of managers influencing risks to prevent, reduce, avoid, protect, self-insure, or transfer risk from one stage of work or subject to another.

There have been many studies around the world on commercial bank risk management. Pyle (1997) explains the theoretical basis and the need for risk management and emphasizes market risk and credit risk. Danske Banking Group (2016) points out the types of risks that need to be managed, including credit risk, market risk, liquidity risk, operational risk, insurance risk, and other types of risk.

The Board of Directors established committees to monitor risks, but although specific roles were defined, these bodies still did not have decision-making authority and only played an advisory role. Clara-Iulia and Zinca (2015) mentioned risks in banking activities and, based on common risk assessment standards of organizations, proposed risk management solutions such as developing a risk culture, improving receivables collection, developing effective and innovative risk models, rethinking capital allocation, developing a risk mitigation vision, and focusing on meaningful risk definition, key processes, coordination at the highest level, clearly defining roles and responsibilities, assessing the level of risk mitigation, the benefits and costs of risk management, and using information technology to support risk management.

The Basel Committee on Banking Supervision of the Bank for International Settlements (2001) pointed out that: For the banking sector, credit risk is considered the risk that accounts for the largest proportion and is an inherent part of the banking sector's core business activities. Goyal (2010), based on the presentation of each pillar of Basel II standards, such as mandatory reserve requirements, supervisory review, strengthening market discipline, and the situation of the Indian banking system, proposes appropriate measures. capital sources for credit risks, capital sources for operational risks, and capital sources for market risks. The study also pointed out the Indian Bank's challenges in replacing internal control and risk management models, especially the application of Basel II standards.

In Vietnam, there have also been many research projects on risk management as an internal challenge of the Vietnamese commercial banking system (Can Van Luc, 2016) [4]. Sustainable development of the banking system is a concept that encompasses risk management (Nguyen Thi Mui, 2014) [11]. The risk situation of Vietnamese commercial banks is associated with issues such as bad debt, black credit, capital appropriation, loss collection, major fluctuations in the currency market, etc. (IDGVietnam, 2013).

There is also a view that specifically addresses risk management, such as liquidity risk management through banks proposing different solution packages to cope with account risks and, when faced with risks, will have sources to compensate for liquidity shortages in a timely manner. The liquidity risks of commercial banks are also systematically researched, analyzed, and long-term solutions proposed (Nguyen Bao Huyen, 2016) [10]. In addition, there are many research projects on scientific topics and research projects on the risk management of Vietnamese commercial banks. Most studies show that the risks of Vietnamese commercial banks are very large and appear quite diverse, so many solutions are needed from many angles, including from the State Bank and commercial banks. Trade, customers, and solutions are given special emphasis on applying Basel II standards.

From the above overview, it shows that the risk management issue of commercial banks needs to be researched, analyzed, and evaluated in association with integration and development factors, as well as pointing out the problems posed for solutions in the near future. In this article, the authors focus on emphasizing global trend factors such as the trend of using Basel II standards and the impact of the Industrial Revolution 4.0, as well as a practical basis in the risk management of commercial banks in the past period.

3. Current Risk Management Status in Vietnam Commercial Banks

Current Status of Risk Management

Commercial banks in Vietnam are currently considered credit institutions in a broad sense and operate under a corporate model, including: Vietcombank, Vietinbank, BIDV, ACB, TechcomBank, VPBank, Agribank, MB, Marintimebank, SHB, Eximbank, Navibank, Sacombank, DongABank, Oceanbank, Kien Long Bank, Nam A Bank, HD Bank, MDB, Vietcapital Bank, SCB, TPBank, and Lienviet Bank. Besides, there are also banks or foreign bank branches in Vietnam and financial institutions.

The types of risks arising for Vietnamese commercial banks are the main subjects of risk management. The types of risks related to Vietnamese commercial banks are usually bad debt risks, liquidity risks, and operational risks. Each type of risk has quite effective management methods. Typically as:

Firstly, manage bad debt risk:

By definition, bad debt is debt that is ineffectively used and cannot be recovered. The ratio of bad debt to total debt of Vietnamese commercial banks in the period 2008–2015 ranged from 1,797% to 3,438%. The years 2012 and 2013 were the two years with the highest bad debt ratio (3,438% and 3,107%), exceeding the allowable threshold of international practice of 3%.

Bad debt risk management solutions are being applied by Vietnamese banks with the aim of reducing the bad debt ratio below the safe threshold. Specifically, restructuring weak banks and promoting mergers and acquisitions (in fact, the State Bank acquired a commercial bank for 0 VND). At the same time, purchasing bad debt from commercial banks through the Credit Institutions Asset Management Company (VAMC) contributes to minimizing the risks caused by bad debt.

The above solution not only overcomes the consequences of system breakdown but also creates conditions for transparency in transactions associated with bad debt in commercial banks. Resolution 42/2017/QH2014 on bad debt handling, recently passed by the National Assembly, has determined the roadmap for bad debt handling as of August 15, 2017. For example, Sacombank plans to resolve about 65-75% of bad debts and outstanding assets in 3 years (2017–2019) to reduce bad debts from 6.81% to 3%.

Second, liquidity risk management:

Liquidity risk is expressed centrally when a credit institution becomes insolvent. Banks' liquidity risk has not been sustainably managed due to term imbalances (Nguyen Hong Son *et al*., 2015) [12].

The liquidity risk of Vietnamese commercial banks is minimized thanks to the State Bank's efforts to continuously reduce ceiling interest rates and encourage large banks to support small banks. Signs of improving liquidity risk are shown in the rapid increase in overnight interbank interest rates, mainly in short periods of time, the reduction in overnight transactions, the absence of public deposit interest rate races, and the fact that there are no signs of deposit decline, even if banks are forced to restructure.

However, the potential liquidity risk of Vietnamese commercial banks is still quite high, and the liquidity risk monitoring problem of the State Bank of Vietnam is not as expected.

In fact, recently, the State Bank has issued many documents to guide and create a legal framework for liquidity risk management, typically: Circular 36/2014/TT-NHNN, dated November 20, 2014. 2014 regulates limits and safety ratios in the operations of credit institutions and foreign bank branches.

Indicators that are considered standards of limits to avoid risks have been enhanced to increase safety in liquidity, including liquidity reserve ratio (>=10%), solvency ratio within 30 days (VND) (>=50%), and 30-day solvency ratio (foreign currency) (>=10%). The maximum ratio of short-term capital used for medium- and long-term loans for commercial banks is 60%. The ratio of outstanding loans to total deposits for state-owned commercial banks is 90%, and for joint-stock commercial banks, it is 80%. This contributes to significantly reducing the liquidity risk of commercial banks.

Third, operational risk management:

According to Basel II, operational risk is the risk of loss due to unsatisfactory internal processes, people, and systems, inactivity, or external factors. This risk can be caused by information technology systems, internal fraud, organizational models, regulations, and work processing processes.

These types of risks appear frequently for commercial banks, such as staff work, an organizational model not consistent with goals and tasks, and issued policies lacking clarity and consistency, causing There are many different interpretations: risks are due to information system errors such as ATM equipment errors, transmission line errors, or the ethics of officials taking advantage of loopholes in management for personal gain.

Operational risk issues related to the ethical qualities of bank staff and information technology infrastructure, especially risks associated with the introduction of new products and services based on technology platforms digitizing.

Current Status of Digital Technology Applications

Following the direction of the State Bank and the need for risk management, Vietnamese commercial banks have researched and deployed technologies to increase operational efficiency, increase customer experience, and reduce costs. bank fees. Some commercial banks have made strategic changes, such as establishing specialized data management departments. Specifically, VietinBank established the Data Management Council in 2019. A number of other commercial banks have also linked up with partners to implement projects to build data warehouses to serve the application of technology. such as: VPBank cooperates with IBM to build a large database; MB cooperates with Infosys;

Some results achieved in implementing new technology applications at Vietnamese commercial banks can be mentioned as follows:

RPA technology deployed and applied at the Bank for Investment and Development of Vietnam (BIDV) has helped reduce operating costs and shorten transaction processing time. This is considered a combination of three advanced technologies: robotic technology, artificial intelligence, and optical character recognition systems. As a result, compared to traditional human-based operations, operating costs have been reduced by 2.7 billion VND, and processing time has been shortened to only 20% compared to before (BIDV, 2019).

Artificial intelligence has been applied by Shinhan Bank Vietnam, Tien Phong Commercial Joint Stock Bank (TPBank), and Viet A Commercial Joint Stock Bank to update information and respond automatically to customers. In mid-2019, Shinhan Vietnam cooperated with Zalo to deploy applications for exchanging information with customers, such as: looking up and updating account balances; opening credit cards; taking out consumer loans; answering questions; and providing information upon request. TP Bank uses artificial intelligence to create a virtual assistant, called T'Aio, on the bank's Facebook page from mid-year. The system has the ability to automatically respond to customer information within 5 seconds, operate 24/7, and continuously learn and improve to gradually become smarter. When receiving a question from a customer, T'Aio will analyze the answers available in the data system and score the level of confidence in being able to answer. If the confidence score is high and exceeds the answerable level, T'Aio will respond to the customer. This process will be repeated and improved so that the answers are increasingly optimized. Another bank also implementing a similar system is Viet A Commercial Joint Stock Bank. The Chat bot system is implemented to automatically answer customer questions about location, transaction fees, the card opening process, and information about interest rates, exchange rates, products, and fee schedules. Chat bots have almost replaced customer service staff, with a response time of just 5 seconds and a huge amount of information.

Regarding the application of voice and facial recognition technology, Viet A Bank, Citibank, and Ban Viet Bank pioneered the application to authenticate customers. Specifically, Viet A Bank has deployed a facial recognition application for transactions in internet banking and mobile banking with a recognition time of only 2–5 seconds. Meanwhile, Citibank deployed voice biometric security technology for customers when calling the bank's service center and moved to completely replace the traditional identification system with personal information.

With the new security application, customers simply need to register voice recognition in Citi's Voice Biometrics. The customer's voice will be recognized within 15 seconds after stating the reason for the call. According to Citibank, this new technology allows for reducing customer service time by about 45 seconds compared to today or confirming customer identification information 66% faster than normal time. At Ban Viet Commercial Joint Stock Bank, the facial recognition system is deployed on transaction channels such as over-the-counter transactions and on applications of the bank's payment partners.

Regarding electronic authentication, the service will be widely deployed at many banks in 2020. The first bank to deploy eKYC is VPBank (mid-2020). The system allows customers to open payment accounts completely online and experience VPBank's digital banking services. Next, this service was deployed at HD Bank, Vietcombank, TP Bank, Ban Viet Bank, National Bank (NCB), and many other banks. The number of new customers at these banks increased rapidly thanks to the convenience of the registration process and shortened waiting times, especially during the COVID-19 epidemic. Banks' data monitoring and management systems have also been improved, helping to reduce operational risks in the customer authentication process as well as updating system information.

4. Challenge and Opportunity

The impact of technologies such as robotic automation, natural language processing, artificial intelligence models, augmented reality, voice and facial recognition technology, etc. has created many opportunities as well as challenges for commercial banks.

Besides the achieved results, the process of applying and deploying new technology by Vietnamese commercial banks still faces many challenges.

The first is Grasp customers' consumption trends. In a world that is becoming increasingly connected, user behavior can change rapidly. In particular, the participation of technology companies in providing increasingly diverse services in the context of low switching costs has created great pressure for retail banks to update and improve services to maintain competitive advantage and maximize user experience.

The second, invest in technology platform channels. Investing in a new technology application always carries many risks, which requires bank management to have determination and mobilize enough resources to carry out the projects.

The third is human resources. Human resources to operate new technology are currently limited, specifically programmers, data analysts, system administrators, and data management specialists. Therefore, in the early stages of the transformation process, commercial banks face a shortage of quality personnel.

The fourth: legal framework. Although the State Bank has issued Document No. 6942/NHNN-VP on enhancing security and confidentiality in payment intermediary activities and is expected to continue to promulgate regulations applying biometric security mechanisms (recognition by face, voice, blood vessels, iris, etc.), the regulations only focus on the payment field. Meanwhile, risk management activities still have many issues that need to be agreed upon, such as customer data security issues, issues connecting reports between banks and supervisory agencies, etc.

With the problems posed during the integration phase, the banking industry is at the peak of change and uncertainty. In a competitive environment, competition is increasing between banks, non-banks, and financial technology companies (FinTech); at the same time, the economic environment of low growth and low interest rates is putting pressure on the medium. Traditional way of earning profits. The problem of bad debt that has not been completely resolved is still a big risk for Vietnamese commercial banks. In addition, the 4.0 Industrial Revolution, with the foundation of the internet of things, big data, and cloud computing, is also impacting and contributing to the rapid improvement of the information technology infrastructure of the banking industry. row. With this perspective, it is necessary to have the most complete and comprehensive risk management framework. Accordingly, Basel II standards are considered the most complete standards in commercial bank governance and need to be fully understood and applied appropriately.

The functions and roles of banks' risk management models and departments need to be promoted with the effective and close support and guidance of the State Bank as well as a team of experts. domestic and foreign scientists. Furthermore, the types of risks due to the impact of the 4.0 Industrial Revolution will have a great impact on banking information security issues such as customer account information and database protection issues. Internally, there is also a great need for proactive technology solutions associated with increasing team capacity and rigorous training in professional ethics. In addition to the radical opening according to comprehensive commitments in the WTO, the ASEAN Economic Community, and commitments in other bilateral and multilateral free trade agreements, the commercial presence of banking service providers is increasing, making competition among banking service providers increasingly fierce. Risks due to service competition are also increasing, so it is necessary to develop science and a system to manage risks due to competition. Types of ethical risks and operational risks will be closely related to these information risks and competitive risks...

5. Solutions to Improve Commercial Banks' Risk Management Capacity

To achieve high efficiency in risk management activities, Vietnamese commercial banks need to focus on implementing the following solutions:

Strategically: To prepare for the transition process, grasp customer consumption trends, and invest in technology platforms, banks need to pay specific attention to the following issues:

- Develop principles when handling regulations in the direction of standardization, automation, simplification, minimizing manual interventions, and taking advantage of the benefits of big data to bring customers the best possible experience.
- Enhance close cooperation with businesses to minimize operational risks. For instance, use automated reports connected through the system to create an early warning system, responding promptly to changes in regulations and business conditions.
- Cultivate a risk culture and reinforce the transmission of values and principles of action throughout the bank.
- Develop a diverse, skilled workforce capable of building and managing new models and data while collaborating with specialized businesses.

Regarding the operational model: The application of new technology will fundamentally change the operational model of commercial banks, with the structure involving the participation of the analysis and advisory departments in proactively assessing risk issues and regulations. This transition helps to lighten the workload for certain departments, such as audit or reporting departments, which can shift their focus to monitoring emerging risks in the digital age.

Regarding the process, the manual operation procedures, and risk reporting: Fewer resources will be needed as they have been simplified, standardized, and automated. The division of labor between humans and machines will also change. In the past, humans had to participate in most of the tasks in the process, but now they only consider exceptional or complex cases.

In terms of information technology and data in the goal that Vietnamese commercial banks need to aim for is the formation of a two-speed architecture and data profiles. The characteristics of this architecture are its flexibility, speed, reliability, and high-quality assurance (Bossert, 2016) [2]. According to these organizations, the data input into the bank does not need to adhere to strict rules. Instead, data users determine the rules when they extract data from the pool. The scope and flexibility of the system allow banks to use big data tools to investigate and analyze complex data.

Regarding human resources: As the transition occurs, manual tasks at Vietnamese commercial banks will be replaced by automated systems. To meet new demands, the workforce will need to consist of data scientists with advanced mathematical and statistical knowledge, as well as experts in machine learning and complex data analysis. They could also be business analysts who play a pivotal role in transforming data insights into actions. However, to recruit candidates for these positions, banks need to establish collaborative relationships with universities and fintech companies in their search for suitable candidates. Additionally, creating an environment that encourages business and innovative spirit is essential compared to the previous risk management-oriented environment. This is because the risk culture needs to change; these new personnel must operate within a complex technological environment, using digital tools, and continuously learning and improving.

Furthermore, for the state, it needs to perfect the legal framework for enhancing security and privacy, issuing regulations and mechanisms for biometric security, addressing customer data privacy issues, and linking reports between banks and supervisory agencies. With a complete legal corridor, commercial banks will have a basis to implement control procedures and enhance risk management capabilities in the most efficient and cost-effective way.

6. Conclusion

The science of modern banking management is continually evolving, and within this system, risk management is an integral component. Today, all banks have established risk management departments, yet risks still occur, highlighting their objective nature and the performance of the machinery tasked with this duty. The refinement of commercial banks' risk management systems must continue in the future.

Risk management in banking is becoming increasingly important and will form a core part of the strategic plans of commercial banks in Vietnam in general and the finance-banking sector in particular. The effective execution of risk management processes in compliance with domestic and international regulations will help commercial banks reduce risk costs and increase customer trust and satisfaction. The Vietnamese commercial banking system has begun to adopt and implement digital technology into its management system, presenting many opportunities and significant challenges for the industry. To enhance risk management capabilities, commercial banks need to implement comprehensive solutions from strategy, infrastructure, operational models, appropriate procedures, and high-quality human resources to meet operational needs; concurrently, state regulatory agencies need to provide a complete legal framework to guide the banks' management activities more effectively.

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