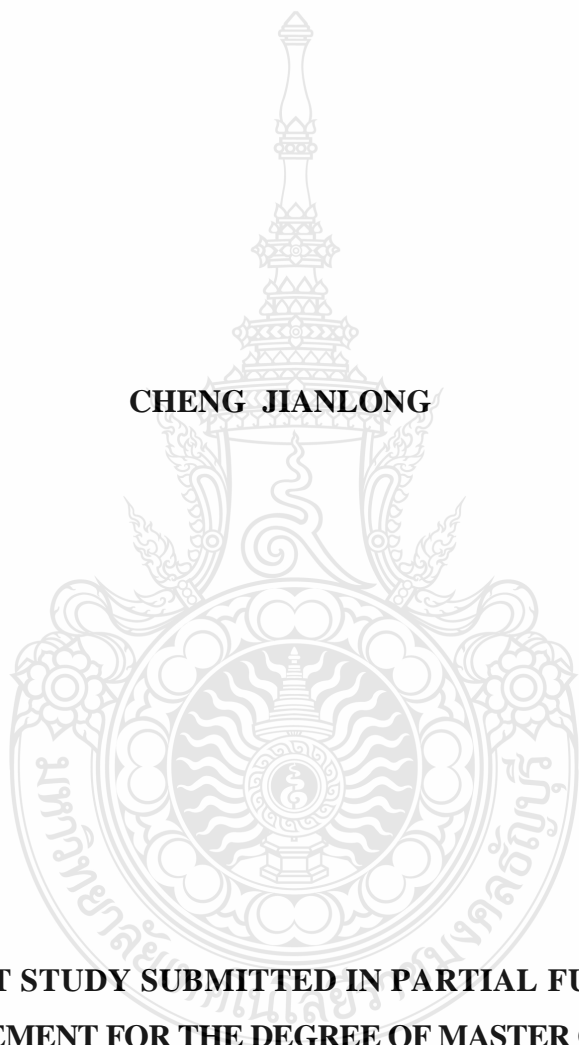# EFFECT OF INTERNET FINANCIAL INTELLIGENCE ON PROFITABILITY OF BANKS IN CHINA

CHENG JIANLONG

**AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENT FOR THE DEGREE OF MASTER OF BUSINESS
ADMINISTRATION PROGRAM IN GENERAL MANAGEMENT
FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
ACADEMIC YEAR 2023
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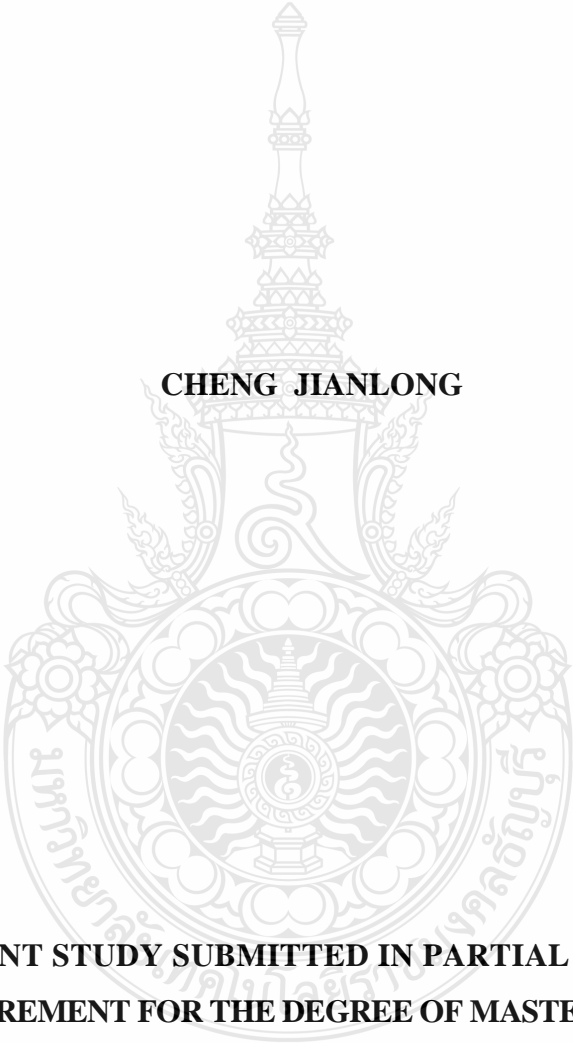# EFFECT OF INTERNET FINANCIAL INTELLIGENCE ON PROFITABILITY OF BANKS IN CHINA

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(.........Mr. Cheng Jianlong ....)

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Independent Study Title	Effect of Internet Financial Intelligence on Profitability of Banks in China
Name - Surname	Mr. Cheng Jianlong
Major Subject	General Management
Independent Study Advisor	Assistant Professor Napaporn Nilapornkul, Ph.D.
Academic Year	2023

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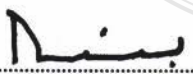
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ABSTRACT

To achieve maximum shareholders' wealth, in terms of the highest market value of common stock, financial institutions are required to improve their business processes by using information technology and large amounts of data in the form of big data. This study aimed to determine the primary aspects of internet financial intelligence that have an impact on the profitability of banks in China and contribute to the development of contemporary financial artificial intelligence to fulfill the requirements of customers.

Data samples included 27 banks in China studied for a period of 8 years during 2014-2021 from which 216 observations were made. The dependent variable used was bank profitability measured as return on equity. There were three explanatory variables: the depth index, the breadth of coverage, and the degree of intelligence. In addition, there were three control variables: leverage ratio, business size, and book-to-market value ratio. This research employed three statistics for data analysis: descriptive statistics, Pearson's correlation and Variance Inflation Factor, and multiple regression.

The findings demonstrated that bank profitability remained positive, indicating that there were no operational losses. The depth index and the breadth of coverage index were statistically significant at the .01 level, reflecting that both were major factors affecting bank profitability. The reverse relationship of the depth index and the breadth of coverage index to bank profitability implied that the study period was in the introductory stages of financial technology development for the banking sector. However, this research supported the present trend of improvements in financial technology and emphasizes the significance of responding to customer demands for the long-term future of the banking sector. The deeper online financial information usage, in terms of a greater variety of financial services and products supplied, may increase the profitability of Chinese banks in the long run.

Keywords: internet financial intelligence, profitability, banks, China

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Cheng Jianlong

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CHAPTER 1
INTRODUCTION

1.1 Research Background and Problem Statement

Especially in China, where internet finance has become a significant and powerful phenomenon, the advent of the internet and digital technologies has had far-reaching effects on the financial sector. Online payment, lending, wealth management, insurance, and crowdfunding are all examples of the types of financial services that fall under the umbrella term "internet finance," which describes the delivery of these products and services over the internet. The benefits of online financial services include reduced expenses, more efficiency, broader reach, and greater consumer convenience. By meeting the needs of neglected populations and inspiring the development of novel business models, it also fosters financial inclusion and innovation. Information security, regulatory compliance, credit default, fraud, and market competitiveness are just a few of the dangers and issues that internet finance confronts. These threats have the potential to lessen the societal and economic advantages of online banking and finance. Therefore, it is crucial to investigate how internet-based financial institutions might reduce their exposure to risk and maximize their return.

Financial knowledge gleaned from the internet has the potential to greatly enhance the safety and profitability of online transactions. Insights into consumer behavior, market trends, risk concerns, and business prospects are all within the reach of internet finance platforms thanks to the data and analytics made possible by internet financial intelligence. It may also aid in the enhancement of their offerings, processes, strategies, and choices. There has only been a small amount of cohesive study done so far on the topic of financial intelligence on the internet. Unfortunately, there does not yet exist a comprehensive and systematic methodology for assessing the online financial intelligence of internet finance platforms. Furthermore, there is a dearth of hard data showing how internet financial intelligence contributes to the success of online banking and other online financial services. Furthermore, the effect of several control factors that may alter the correlation between financial intelligence gained online and financial success must be taken into account.

The purpose of this research is to remedy these gaps by presenting a new index method to evaluate the financial acumen of China's internet-based financial platforms. There are three aspects to the index system: the intelligence index (INDEX), the breadth of coverage (DEPTH), and the depth of coverage (RANGE). The depth index is a measure of how much and how high-quality data online financial companies gather. The comprehensive nature of the coverage is indicative of the variety and quantity of data sources used by online banking and financial systems. The smarts measure how well and how complexly internet-based financial systems handle and analyze data.

The research also intends to analyze how internet financial intelligence influences the success of Chinese online financial services. Return on equity (ROE) is a common metric used to evaluate the profitability of a business. Other factors that may affect profits are also taken into account in the analysis: leverage ratio (LEV), company size (SIZE), and book-to-market value ratio (BM).

1.2 Study Objectives

The study objectives are:

1. Provide the knowledge related to revolutionary index to evaluate the financial acumen of China's online finance platforms

2. Integrate the body of theoretical work on internet finance, AI, big data analytics, and monetary output in the study

3. Analyze the impact of internet financial intelligence on Chinese banking performance

4. Recommend banking sector to improve internet financial intelligence as online finance platforms to increase competitive potential

1.3 Research Questions

The study aims to respond to three research questions:

RQ1：Does the depth index (DEPTH) have a significant positive impact on the profitability of banks in China?

The purpose of this enquiry is to determine whether a rise in a bank's profitability is correlated with a greater depth index, which measures the degree to which banks make use of internet-based financial information. The purpose of this study is to investigate the connection that exists between the breadth of online financial intelligence and the profitability of banks in the setting of China.

RQ2：Does the breadth of coverage (RANGE) have a significant positive impact on the profitability of banks in China?

The purpose of this enquiry is to investigate the connection that exists between breadth of coverage, often known as the degree to which online financial information can be used across a variety of departments inside banks, and profitability. The purpose of this study is to investigate whether or not increased utilisation of internet financial intelligence across a larger spectrum of banking applications adds to increased profitability for Chinese banks.

RQ3：Does the degree of intelligence (INDEX) have a significant positive impact on the profitability of banks in China?

This enquiry analyses the relationship between the degree of intelligence, which symbolises the amount of complexity and efficacy of online financial intelligence application, and the profitability of banks in China. The purpose of this study is to ascertain whether or not improved levels of intelligence in the use of online financial services result in enhanced levels of profitability for Chinese banks.

1.4 Research Framework

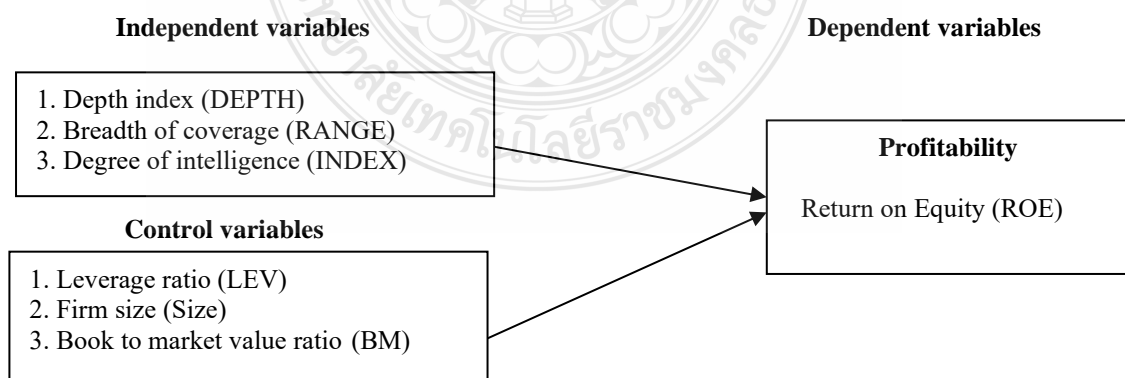Thereafter, researchers conducted a research framework to study in-depth to respond to research questions as below.

Figure 1: Research framework

1.5 Study Scope

1.5.1 Sample selection and data source

The population and sample of the study are banks in China, including both large and small-medium sized joint-stock commercial banks. The study period is between 2014 to 2021. The explanatory variables related to internet financial intelligence are the usage depth (depth), coverage breadth (scope) and intelligence level (index) of smart finance. They were retrieved from the fourth issue of the Digital Inclusive Finance Index. The bank characteristics were collected from the financial statistics yearbook of China and the annual reports of the banks on their websites. The sample size included 27 banks for 8 years of data was totally 216 observations.

1.5.2 Variable selection

The study classified variables into three groups: Explanatory variables, dependent variable and control variables. They were presented as below.

1. Explanatory variables

The explanatory variables were related to financial intelligence factors on the internet. When financial institutions are able to use internet technology, big data, and artificial intelligence to enhance their services, products, and operations, they are said to have online financial intelligence. One author suggests that one might evaluate one's level of financial savvy online along three dimensions: depth, breadth, and degree.

The degree to which banks and other financial institutions use internet technology to provide their services and products online is quantified by the Depth index (DEPTH). It's an indication of how advanced financial institutions have become in terms of digitization and creativity. If you want to know how financially savvy people are on the internet, look at the depth index. Online banking transactions as a percentage of total banking transactions provides a measure of DEPTH.

The breadth of coverage (RANGE) is a metric used to evaluate the depth and variety of online banking services provided by financial organizations. It is an indication of how well-established a financial organization is and how satisfied its clients are. The depth of one's online financial knowledge may be gauged by looking at the breadth of their coverage. Number of banking services and goods available online as a percentage of all banking services and products.

The INDEX quantifies the degree to which banks and other financial organizations use big data and AI to improve their decision-making, risk management, and operational efficiency. It's an indication of how far financial institutions have come in their data-driven and smart transformation. Higher IQ correlates to more financial savvy when it comes to the web. The INDEX may be determined by dividing the sum spent on AI by the sum spent on IT.

2. Dependent variable

The study employed banks profitability as dependent variable. The financial health and competitiveness of a bank may mostly be gauged by its profitability. It is a measure of a bank's capacity to turn a profit from its assets, equity, and activities. Return on assets, return on equity, net interest margin, and net income margin are all examples of profitability metrics. The ROE measures the return on shareholders' investment and shows the efficiency and effectiveness of capital usage, making it the most popular measure of profitability in the banking business. Profitability of banks is evaluated herein using ROE as the dependent variable. To determine return on equity (ROE), divide net income by average equity.

3. Control variables

Control variables in the study include bank size, leverage ratio, book-to-market ratio as below.

The level of debt carried by financial organizations is quantified by the leverage ratio (LEV). It is a reflection of banks' propensity to take risks and their capitalization structure. Financial institutions' risk exposure and interest expenditure could go up, but their returns on equity would be magnified by a greater leverage ratio. As a result, the leverage ratio's impact on profits is nebulous and is conditional on the balance between risk and reward. entire liabilities are divided by entire assets to get at LEV.

The size of a company or organization (SIZE) is a proxy for its prominence and resources in the industry. It's a representation of the financial sector's scale economies, scope gains from diversification, and negotiating leverage as a whole. Greater complexity, bureaucracy, and regulatory scrutiny are all indicators of a greater business size, which may have both positive and negative effects on profitability. As a result, the impact of company size on profitability is similarly nuanced and relies on the relative importance

of the benefits and drawbacks. The natural logarithm of total assets is the formula for SIZE.

Financial institutions' value and future growth prospects may be gauged using the book-to-market (BM) ratio. It indicates the market's expectations and the potential for financial institutions to expand their profits in the future. There may be space for improvement or revaluation if the market value is lower than the book value, which might raise profitability. However, if the market value is lower than the book value, undervaluation or limited growth prospects may have reduced profitability. Since market circumstances and financial institution performance are variables, the impact of book-to-market ratio on profitability is likewise uncertain. Book value of equity divided by market value of equity yields BM.

1.5.3 Research Hypotheses

The study studied the impact of financial intelligence factors using three variables: depth index (DEPTH), breadth of coverage (RANGE), and degree of intelligence (INDEX) on banks profitability. Therefore, research hypotheses were conducted:

H1: The depth index (DEPTH) has a significant positive impact on bank profitability.

H2: The breadth of coverage (RANGE) has a significant positive impact on bank profitability.

H3: The degree of intelligence (INDEX) has a significant positive impact on bank profitability.

1.6 Definition

1.6.1 Intelligent Finance

This means the use of information technology and large amounts of data, particularly in the context of the internet and mobile digital technologies, to improve the efficiency and competitiveness of service sector especially financial services. The benefits offered by artificial intelligence, blockchain technology, cloud computing, and large amounts of data to provide cutting-edge and individualized solutions to consumers, save costs and risks, increase productivity and transparency. For banking sector, the intelligent finance may refer to a variety of applications within the realm of financial services, including

banking, payment processing, lending, investing, wealth management, insurance, and financial regulation (Ji & Tia, 2022).

1.6.2 Internet Intelligent Finance

Internet Intelligent Finance (IIF) aims not only the development of innovative business models and value propositions for both clients and service providers, but also the enhancement of the effectiveness, precision, and individualization of financial goods and services. Technologies that fall under the umbrella of artificial intelligence (AI) make it possible for robots to carry out cognitive tasks especially for financial services, including customer service, risk management, fraud detection, credit scoring, wealth management, and regulatory compliance (Königstorfer & Thalmann, 2020).

1.6.3 Bank profitability

The return on equity (ROE) is a measurement that determines how efficiently a bank utilises the money contributed by its shareholders to create profits. Operating expenses have an effect on ROE. If your ROE is greater, it shows that your business is more profitable and is producing more value. Several variables, including market circumstances, consumer preferences, competitive pressures, regulatory requirements, technical advancements, and strategic decisions, may have an effect on operating expenses. In a climate that is both dynamic and unpredictable, banks confront a variety of difficulties and possibilities when it comes to controlling their operational expenses (Raviadaran, Dastane, Ma'arif, & Mohd Satar, 2019).

1.7 Research Study Structure

The main research study contents are as follows:

Chapter 1: Introduction: It mainly introduces the research background and purpose of this paper, expounds the research questions and scope of this paper, explains the interpretation of intelligent finance and bank profitability.

Chapter 2: literature review: This paper mainly describes the internet intelligent finance, intelligent finance, bank profitability and other related theories. Additionally. The study included prior studies related to intelligent finance and banks return.

Chapter 3: Research methodology: The study included research scope for both size and period. Statistical tools for study were included.

Chapter 4: Empirical analysis and discussion: The chapter reports and interprets research results and then discusses them by providing the evidences and citation from prior research papers.

Chapter 5: Conclusions and suggestions: This chapter summarizes the above research results and puts forward specific suggestions for optimization.

1.8 Research Contributions

The study aims to gain contribution for stakeholders as below.

1. Commercial banks: This study examines the

The purpose of this study is to investigate the influence that various aspects of online financial intelligence have on bank profitability. Thus, the research results will assist bankers to develop online services to respond to their customer requirements to increase competitive potential.

2. Financial technology developers

The purpose aims to examine the impact of internet financial intelligence on banks' performance. This examines the capacity of banks to enhance their operations and services via the use of information technology and large amounts of data. Therefore, it will be useful for financial technology developers to study in-depth of bank behaviors and banks' customer behaviors to develop financial technology to respond their needs.

3. Bank managers, regulators, and policymakers

The research results will be useful for bank managers in that it can assist them in determining the strengths and weaknesses of the online financial services offered by their institutions and in optimizing their strategy in accordance with those findings. This will allow the banks to reduce costs and increase efficiencies while also improving their decision-making and risk management capabilities.

4. Technology infrastructure

This study offers great application value that may be used to the advancement of knowledge and practice about internet infrastructure in China. It may serve to shed light on the present state of affair of internet finance and its impact in China. Thus, government may pay attention about technology infrastructure for the competitiveness and sustainability of banks in China.

5. Academic signification

This study provides a contribution to the body of literature on internet finance, which is a sector that is fast expanding and undergoing rapid evolution. Internet finance is a discipline that integrates information technology, big data, and artificial intelligence to deliver financial services that are both innovative and convenient. In addition, this work has considerable theoretical relevance for expanding our knowledge of internet finance, bank profitability drivers, and the role of artificial intelligence in finance

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CHAPTER 2
LITERATURE REVIEWS

This chapter prepares to review the theoretical and conceptual of finance and financial intelligence technology. In addition, related previous research papers are also included in this chapter. The details of each topic are presented below.

2.1 Theoretical and Conceptual of Finance and Financial Intelligence Technology

2.1.1 Bank profitability

Profitability is a measure of a business's profit relative to its expenses. Thus, two keys factor to measure profits are incomes and costs. However, there are many evaluation tools of profitability that rely on accounting basis.

Accounting-based tools of profitability employ accounting information to assess the firm's performance. The tools are expressed in terms of financial ratios, which reflect a firm's performance. Generally, the ratios reflect the firm's profitability such as gross profit margin, net profit margin, return on assets (ROA) and return on equity (ROE). The details of each profitability ratio are explained below.

Gross Profit Margin: This ratio indicates how well the company can generate gross profits. Also, it addresses a firm's cost of goods sold. The measurement of gross profit margin is the proportion between gross profits and total sales as below.

$$\text{Gross profit Margin} \quad = \quad \frac{\textbf{Gross profits}}{\textbf{Total sales}}$$

Net Profit Margin: This ratio shows how much net profits are derived from every dollar of total sales after subtraction all costs. The formula for net profit margin is:

$$\text{Net profit Margin} \quad = \quad \frac{\textbf{Net profits}}{\textbf{Total sales}}$$

Return on Assets (ROA): This ratio evaluates how effectively the company employs its assets to generate the firm's profits. It measures operational efficiency as below.

$$\text{Return on Assets} \quad = \quad \frac{\textbf{Net profits}}{\textbf{Total assets}}$$

Return on equity (ROE): different from ROA; this ratio focuses on equity capital. Its measurement is below:

$$\text{Return on Equity} \quad = \quad \frac{\textbf{Net profit}}{\textbf{Total equity}}$$

Earnings per share (EPS): This ratio focuses on how well the company can generate profits per a common stock. The formula for earning per share is:

$$\text{EPS} \quad = \quad \frac{\textbf{Net profits} - \textbf{Devidend of preferred stocks}}{\textbf{A Number of outstanding common stocks}}$$

Interest-Based Income: The net interest margin (NIM) is the most traditional source of bank profitability. Banks lend money to borrowers at a greater interest rate than they charge depositors for the money they deposit, which is known as interest income. The NIM is represented by the difference between these two rates (Soewarno & Tjahjadi, 2020).

Managing Effectively: Profitability of the bank is significantly influenced by effective management. Effective risk assessment, credit management, operational efficiency, and prudent investment choices are all part of it. The capacity of a bank to produce money and control expenses may be significantly impacted by the management level of the bank.

Financial Situation: Profitability of banks is substantially impacted by the status of the economy overall. A stronger demand for loans occurs during times of economic expansion, which might boost bank profits. Recessions or downturns in the economy may result in greater default rates, which have an impact on profitability (Raviadaran et al., 2019).

Market rivalry: Profitability in the banking industry is also impacted by the degree of competition. While limited competition can enable banks to charge greater fees and so boost profits, considerable competition might impair profitability by pushing down the pricing of financial services.

2.1.2 Financial intelligence concept

Internet intelligent finance is based on digital technology and big data. Its unique advantages can ease the capital constraints of enterprises in terms of information asymmetry, macro environment and enterprises' own information disclosure (Cho & Chen, 2021). The specific sources of these capital constraints affect the operating cost of the bank, which consumes a certain amount of financial resources in information searching, credit qualification investigation, financing, single channel, and other aspects. These constraints directly reduce bank profitability. The mitigation effect of internet intelligent finance on capital constraints can also play a restraining effect on the operating costs and through to bank profitability. The influence of internet intelligent finance on profitability of banks can be explained in to three dimensions as following (Paulet & Mavoori, 2019).

Depth index and information asymmetry

The depth of internet intelligent finance usage is measured by the depth index. The penetration of internet intelligent finance is reflected by examining the number and amount of people who continue to use the internet intelligent finance third-party payment platform. It really integrates internet intelligent finance into daily life, and the degree of continuous use is the real depth of use. For example, Internet intelligent finance can be extended to payment services, money fund services, credit services, insurance services, investment services and credit services. In terms of specific measurement indicators, the major focus is on the actual use of the total volume index and the use of the activity index (J. Zhao, Li, Yu, Chen, & Lee, 2022).

Information asymmetry mainly exists between enterprises and banks in the financing process due to the existence of adverse selection. For example, lenders, namely banks and other financial institutions, want to provide loan services to enterprises. They are in a passive position and can only conduct qualification examinations according to the materials provided by the enterprises, which can lead to erroneous decisions. Another example of information asymmetry for a bank and enterprise may come from incomplete disclosure of financial statements, unreliable information, and poor-quality information. These lead to higher cost of capital for enterprise.

The use depth of internet intelligent finance has risk control, and the improvement of the use depth indicates that users 'fund information will be stored more in a large database, so

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it can horizontally reflect the users' use of funds for a period. At the same time, the information collected by internet intelligent finance comes from third-party external payment platforms such as e-commerce platforms, social networks, and national administrative units. This information is not only widely scattered, but also authentic, and can provide qualification reference channels for banks in multiple dimensions. Therefore, the cost of the qualification examination and examination system cost will deepen as the internet intelligent financial use depth, information asymmetry can improve, in the multi-dimensional information ocean, bank credit process and loan management are simplified, indirect save for the enterprise financing costs, promote the bank profitability (Mekinjić, 2019).

Coverage breadth of internet intelligent finance

The coverage breadth of internet intelligent finance is measured by the coverage index in terms of the radiation range of Internet intelligent finance by examining the number of third-party payment accounts bound to bank cards. It examines the characteristics of internet cross-regional and online transactions. The more third-party payment accounts registered by users, the more comprehensive the users are covered by internet intelligent finance(Lei, Xu, & Jin, 2022). Combined with the observation of the number of people, this leads us intuitively understand how many users are covered by internet intelligent finance and the specific aspects of coverage. Especially with the more and more rich functions of the third-party payment, the third-party payment has also become an important channel for financial management and financing, so the internet intelligent finance can also cover specific fields such as financial management and financing channels.

The limitations of the enterprise include the lack of comprehensive competitiveness, weak ability to combat risks, irregular management, unreasonable governance structure and special industry, the lack of comprehensive competitiveness will cause the enterprise to operate on the securities trading platform; the weak ability to combat risks and irregular management will also make the bank think that the enterprise has no repayment ability and cannot pass the qualification examination; or for companies in emerging industries, the social understanding and recognition are not enough, causing difficulties in both bank operation and bank operation(Cheng , 2020). For enterprises with limitations, when their ability have not reached a certain height, there are not many financing channels and financing platforms, so they can only borrow loans with higher interest rates to raise

funds. Compared with these enterprises can normally borrow money or bank operation of enterprises, will be much higher than the bank operating costs(Kumara, 2021).

The coverage of Internet smart finance has good accessibility. It can use big data, cloud computing, mobile payment and other emerging technologies to build a variety of financing platforms and financial products and will also pay attention to product service innovation. For example, P2P online lending, crowdfunding, supply chain finance and other diversified financing platforms and financing products. Internet intelligent finance improves the ability to reach the coverage of financial services and can provide more financing choices and financing channels for enterprises with limitations. Without traditional financing, it can obtain good financing methods through the Internet intelligent financial platform. Secondly, Internet intelligent finance focuses on product innovation (Ayadi, Bongini, Casu, & Cucinelli, 2021). When a variety of non-homogeneous products appear in the market, enterprises can also choose suitable financial products according to their own financing needs, or even customize unique financial products. In this way, more targeted help enterprises in need of financing to carry out personalized financing. Such diversified and personalized financing platforms and financing channels can reduce unnecessary expenditures for enterprises and reduce the operating costs of banks. Finally, product innovation and the broad coverage and resource allocation brought by multiple products can lower the threshold and ultimately reduce the operating cost of banks.

For the Internet intelligent financial coverage breadth index, it is directly related to the number of bank cards and electronic accounts registered by users, rather than simply the number of outlets and the number of financial service personnel. Internet intelligent financial local across regional, not limited by geographical factors, measure coverage breadth index, also don't need the actual geographical location, only need to ensure that the user can use the binding bank card of the Internet intelligent financial operation, so you can bind the bank card number to cover the size of the breadth index. Third-party platforms and accounts are the key to Internet intelligent finance(Kitsios, Giatsidis, & Kamariotou, 2021). Only covering the third-party platform is the coverage of Internet intelligent finance; the depth index of Internet intelligent finance is measured by the actual use of Internet intelligent financial services. Whether from the type of financial services or the use, it mainly adopts the number of users in the registered users. To measure the

use of the depth index, which combines convenience, low cost and credit, and forms the advantages of low cost and low threshold (Wen, Yang, Gan, & Pan, 2021).

Degree of intelligence

The intelligence degree of internet intelligent finance is measured by the intelligence degree index. By meeting the conditions of convenience, low cost and credit, the usage of users in internet intelligent finance is investigated. Internet intelligent finance has the advantages of low cost and low threshold, and it is also a prerequisite for the development of Internet intelligent finance (Chen, You, & Chang, 2021). One of the reasons why users are willing to use Internet intelligent finance is also because of its convenience. Specifically, the Internet intelligent financial services more convenient (such as mobile payment accounts for the proportion of total payment), the lower the cost (such as consumer loans and small micro enterprise loan interest rate is low), the higher the degree of credit (such as the deposit payment accounts for the proportion of total payment), means that the value of the Internet smart financial is better reflected.

The macro financial environment includes interest rate environment, overall credit environment and resource allocation environment, in our state, Whether it's the bank operation, the environment, or the bank operating environment, There is not a direct communication between investors and fund-raisers, Instead, that fund-raisers provide financing information in the financial markets, Selected by investors or by lenders, Corporate information only provides good information, The opacity of information leads to businesses not being trusted, Less financing, Multiple financing or multiple channels of financing, Thus increasing the operating cost of banks; The capital environment of high interest rates also makes the bank operating costs of enterprises remain high; The overall credit environment has no better measurement system, On the issue of corporate credit, Banks only review the fixed financial indicators of enterprises, Audit standards are single and the public, For emerging enterprises with special industries and have potential, Would be excluded by the banks, Financing is available only possible through other abnormal channels, At the same time, it will also bear the high bank operating costs; In the pre-loan inspection and post-loan supervision of credit institutions, Banks have to spend a certain cost of information search, And those costs will eventually be passed on to the financiers, Make it bear a part of the bank operating costs(Sang, 2021).

Inclusive finance, the degree of intelligence is efficient and accessible. Relying on information technology and massive data information, it can indirectly reduce the bank operating cost of enterprises in terms of financing efficiency, information search and the establishment of credit system. Firstly, Internet intelligent finance can cross regions, because the Internet connects economic subjects. It breaks the traditional financial model, builds an open and equal Internet trading platform, and directly connects financiers, investors and lending institutions. The development of Internet intelligent finance and the improvement of digitalization make information accessible.

With the rise of diversified financing needs in the market, Traditional financing channels are difficult to meet the "taste" of different enterprises; Investors' investment requirements can all be recorded and reflected, Supply and demand are free to choose ways in their own favor, Each shall match and trade according to the information, Breaking through the constraints of time and region, Efficient and fast trading activities around financing, Omitting the middle link, It also saves on intermediate costs; In terms of banking operations, Information on external platforms collected by banks, The "credit investigation system" and the risk management mechanism without mortgage guarantee can be formed through the calculation model, By tracking the information used by corporate loans, Control of the funds, Greatly reduce the degree of information asymmetry and the financing risk, therefore, Companies without the risk of financing misallocation and tracking funds, Then achieved the purpose of reducing the operating cost of the bank.

2.1.3 Development theory of Internet Intelligent Finance

The proliferation of online banking, e-commerce, and third-party payment systems has been made possible by the internet. This has led to an increase in the simplicity and convenience of conducting financial transactions. Users are now able to make payments, transfers, investments, and a variety of other activities whenever and wherever they want thanks to the ongoing expansion of the accessibility and usefulness of financial services made possible by mobile devices.

The conventional financial sector was presented with both new obstacles and new possibilities as a result of the proliferation of mobile technology and the internet. One the one hand, they raised the competition and disruption from new entrants, such as fintech startups and big-tech corporations, who exploited their digital capabilities and

customer bases to provide innovative and low-cost financial solutions. This was accomplished by using their digital capabilities and client bases. On the other hand, they created enormous volumes of data and information that could be put to use to improve decision making, risk management, customer service, and product development.

Financial institutions have begun to utilize artificial intelligence technology to supplement their core skills and develop new sources of competitive advantage as a means of coping with the difficulties and possibilities presented by these trends. Machine learning, natural language processing, and computer vision are the three primary subfields that fall under the umbrella of artificial intelligence technology. The term "machine learning" refers to the capability of computers to acquire knowledge from data and carry out activities that would typically need the intellect of a person, such as categorization, prediction, optimization, and suggestion. The term "natural language processing" refers to the capacity of computers to comprehend and produce natural language documents and speech. Some examples of natural language processing include translation, summarization, sentiment analysis, and conversation. Face identification, object detection, scene comprehension, and picture production are all examples of computer vision applications. Computer vision refers to the capacity of computers to perceive and interpret visual information, such as what you see when you look in a mirror (Fu, Liu, Chen, Yu, & Tang, 2020).

In the field of financial services, the deployment of AI technology may be broken down into four different categories: client interaction, product innovation, process optimization, and risk management. The term "customer engagement" refers to the use of artificial intelligence (AI) technology with the goal of enhancing the contact and connection that exists between customers and the financial providers that serve them. For instance, artificial intelligence may allow tailored recommendations based on the interests and behaviors of customers, chatbots that can answer questions and give guidance, biometric authentication that can boost both security and convenience3, and robo-advisors that can provide automated financial advice. Product innovation is the process of using artificial intelligence technology to develop new or enhanced financial goods and services that satisfy the wants of customers or find solutions to challenges faced by customers.

For instance, artificial intelligence may make possible alternative credit rating based on non-traditional data sources, dynamic pricing based on real-time market

circumstances, smart contracts that can autonomously execute transactions, and tokenization that can digitally represent assets. The use of AI technology to the streamlining or automation of financial procedures and workflows is what is meant by the term "process optimization." For instance, AI can enable intelligent automation, which can carry out repetitive or complex tasks more quickly and accurately; data analytics, which can extract insights from large or unstructured data sets; natural language generation, which can produce reports or documents automatically; and cloud computing, which can provide scalable and flexible computing resources. All of these applications can be enabled by AI. The application of AI technology in risk management refers to the process of identifying, measuring, monitoring, mitigating, or preventing potential monetary losses. For instance, artificial intelligence can enable fraud detection, which can spot anomalies or suspicious activities; cyber security, which can protect data and systems from attacks; compliance monitoring, which can ensure adherence to regulations or policies; stress testing, which can assess the resilience of financial institutions under a variety of different scenarios; and so on.

The evolution of IIF is being pushed forward by a number of forces, including advances in technology, pressure from competitors, requests from customers, and the backing of regulatory authorities. The fast development in artificial intelligence capabilities is referred to as technological progress. These capabilities include processing power, data availability, algorithmic innovation, and interoperability. Customer demand is the term used to describe the expanding expectations and preferences of financial customers. These expectations and preferences include things like ease, accessibility, personalisation, and empowerment. The term "competitive pressure" refers to the growing danger and opportunity posed by new entrants and incumbents in the financial sector. Examples of new entrants and incumbents in the financial industry include fintech startups, large technology corporations, and digital banks. In the context of the financial sector, the term "regulatory support" refers to the shifting function and posture of regulators and policymakers in areas such as allowing innovation, balancing risks, and encouraging inclusivity.

The development of IIF is confronted with a number of obstacles, including ethical concerns, a shortage of talent, organizational roadblocks, and technological constraints. The term "ethical issues" refers to the possible negative affects or challenges that AI applications may have on society as a whole as well as on individuals. Some examples

of ethical issues are prejudice, discrimination, privacy, and accountability. The term "talent gaps" refers to a lack of or a mismatch of skills and competencies necessary for the adoption and implementation of artificial intelligence (AI), such as data science, AI engineering, business acumen, and change management. The problems or hurdles associated with changing or integrating AI into the pre-existing structures and cultures of financial institutions are referred to as organizational barriers. Examples of organizational barriers include legacy systems, segregated functions, inertia, and opposition. Explainability, robustness, scalability, and security are some examples of technical limits(Q. Zhao, Tsai, & Wang, 2019). These limitations allude to the intrinsic obstacles or trade-offs that come with AI technology itself.

Financial institutions need to adopt a comprehensive strategy that covers several levels of the organization in order to be successful in overcoming these hurdles and realizing the full potential of the IIF. This strategy incorporates the following four essential components: a technological core, data assets, an operational model, and a strategy. Strategy is the process of developing a distinct vision and a path for transforming an organization into one that prioritizes AI and is aligned with business goals and the requirements of customers. The term "technology core" refers to the process of updating and investing in the infrastructure and platforms that lie underneath AI and make its deployment and integration possible. The term "data assets" refers to the process of gathering and maintaining various sources of high-quality data for the purpose of feeding them into AI applications and generating value. The term "operating model" refers to the process of revamping roles and procedures that make it easier for different business units and technology teams to work together.

2.1.4 Theory of financial inhibition and financial deepening

The term "financial repression" refers to a policy framework that enables a government to refinance its debt at relatively low interest rates with financial institutions. These interest rates are often lower than the market rate or the rate of inflation. By imposing reserve requirements, capital adequacy criteria, or outright quotas, one typical method of financial repression is the practice of compelling financial institutions, such as banks and other financial intermediaries, to hold a greater quantity of government bonds than they otherwise would like. Other forms of financial repression include capping interest rates,

taxing financial transactions, and limiting the movement of money across borders (Guo & Zhang, 2023).

By reducing the cost of their borrowing and expanding the size of the captive domestic market they have for their debt, governments may lighten their debt loads via the use of financial repression, which is one interpretation of this term. Repression of the financial system is another tool that governments might use to assist pay their budget deficits, particularly during times of conflict or emergency. However, financial repression may also have adverse impacts on the economy, including as distorting the allocation of resources, discouraging savings and investment, limiting financial innovation and efficiency, and producing inflationary pressures. These effects can be compounded by a reduction in the economy's capacity for innovation and efficiency.

The term "financial deepening" refers to the process of expanding the scale, breadth, and variety of the world's many financial systems. Indicators such as the ratio of credit to GDP, the ratio of wide money to narrow money, the ratio of bank deposits to currency, and the ratio of stock market capitalization to GDP are some examples of indicators that may be used to quantify financial deepening. Expanding the variety of financial goods and services that are offered to individuals and companies may also be considered a kind of financial depth. Some examples of such products and services include insurance, pensions, mortgages, leasing, and factoring.

It is possible to look at the process of deepening the financial system as a means for countries to increase their capacity for growth by enhancing their capacity for financial intermediation. Deepening the financial system may also assist countries in overcoming the effects of shocks from the outside world, diversifying their risk profiles, increasing savings, more effectively allocating resources, and fostering innovation and entrepreneurialism. Deepening the financial system may have positive impacts on the economy; but, it may also have unintended consequences, such as an increase in financial instability, the formation of asset bubbles, the worsening of economic inequality, or the facilitation of money laundering and tax evasion.

It is important to keep in mind that the connection between financial repression and financial deepening is a nuanced one that is very context-dependent. In some circumstances, financial repression may impede the process of financial deepening by

decreasing competition and innovation in the financial sector, lowering the amount of credit available to the private sector, or producing distortions and inefficiencies in the overall financial system. In certain instances, financial repression may help to encourage financial deepening by, among other things, providing a reliable source of money for the government and the public sector, producing a demand for alternative financial instruments or channels, or driving institutional and regulatory changes in the financial sector (Rahman, Yousaf, & Tabassum, 2020).

The theory of financial repression and financial deepening may assist to explain the development of the financial system through time in various nations and regions. This can be done by looking at how the system has changed over time. For instance, many industrialized nations went through a period of financial repression following World War II in order to pay off their war debts, fund their rebuilding, and advance their growth. During the 1970s and 1980s, they made modest changes to liberalize their financial systems in order to encourage further financial development and integration with the global economy. But a few of them were also hit by financial crises and instability as a direct consequence of excessive deregulation and speculation in the financial markets.

During the early phases of their growth, the majority of emerging nations went through a period of financial repression to assist their efforts to industrialize and modernize their economies. They also liberalized their financial systems on a progressive basis during the 1980s and 1990s in order to facilitate financial depth and access to foreign capital. However, several of them were also hit by financial crises and volatility as a consequence of early liberalization and contagion, which led to a chain reaction(Lee, Li, Yu, & Zhao, 2021).

The theory of financial repression and financial deepening may also be helpful in analyzing the influence that the growth of the financial sector has had on other subsectors of the economy, such as the agricultural sector. For instance, a number of studies have found that financial repression can have a negative impact on agricultural productivity and growth. This is because it lowers the incentives for farmers to invest in new technologies or inputs, decreases the availability and affordability of credit for farmers, and increases their exposure to price fluctuations and natural disasters. On the other hand, a number of studies have come to the conclusion that financial deepening can

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have a beneficial effect on agricultural productivity and growth. This can be accomplished by expanding farmers' access to a wider variety of credit options, improving their risk management and insurance choices, or making it easier for them to participate in value chains or markets.

The effect that increased financial development has on agriculture may also be contingent on several other aspects, such as the degree of agricultural sector development (e.g., subsistence versus commercial), the level of competition and efficiency in the agricultural market (e.g., monopoly versus perfect competition), or the standard of property rights and contracts in rural areas (e.g., land tenure security versus land grabbing). Therefore, it is essential to take into account both the advantages and the costs of financial growth for agriculture in a variety of situations and settings(Y. Li & Chen, 2021).

2.1.5 Financial Intermediation theory

The theory of financial intermediation is a subfield of economics that focuses on analysing the functions and roles that financial intermediaries play in modern economies. Financial institutions such as banks, insurance firms, mutual funds, and pension funds are examples of financial intermediates. These organisations function as middlemen between savers and borrowers in the financial system. The objective of the theory of financial intermediation is to give an explanation for why financial intermediaries exist, what services they provide, how they function, and how their actions influence the distribution of resources and the overall functioning of the economy(J. Li, Li, & Wei, 2020).

The provision of liquidity to the economy is one of the primary roles that financial intermediaries are expected to play. The ease with which an asset may be changed into cash or another asset without suffering a significant loss in value is referred to as its liquidity. Liquidity is created by financial intermediaries when illiquid assets, such as loans or mortgages, are converted into liquid liabilities, such as deposits or insurance policies. They make it possible for savers to have access to their savings whenever they need it, and they make it possible for borrowers to get financing for the investments they want to make. The theory of financial intermediation examines how financial intermediaries handle the risk of not being able to pay their commitments to depositors or

policyholders when those parties demand their monies. Liquidity risk refers to the danger of not being able to satisfy such obligations.

Monitoring the borrowers and enforcing the contracts is another one of the responsibilities of financial intermediaries. The practise of acquiring information regarding the activities, performance, and creditworthiness of the borrowers is referred to as monitoring. The word "enforcement" refers to the steps that are performed by the intermediaries to guarantee that the borrowers comply with the other contractual requirements and either return their loans or refund their loans on time. The reason why financial intermediaries are able to fulfil these responsibilities is because they have an edge over individual savers when it comes to decreasing information asymmetry. This refers to the circumstance in which one party has more or better information than another party. Both adverse selection, which is the difficulty of attracting low-quality borrowers who are more likely to default, and moral hazard, which is the problem of enticing high-quality borrowers to behave in a hazardous or opportunistic way after acquiring money, may be caused by information asymmetry. Adverse selection is the problem of attracting low-quality borrowers who are more likely to fail. The theory of financial intermediation investigates how optimum contracts and incentives may be designed by financial intermediaries to address the issues that plague financial markets and to improve both their efficiency and their level of stability.

The facilitation of involvement in the financial sector is the third role that financial intermediaries play in the economy. Participation costs are the expenses incurred while acquiring knowledge of and making good use of various financial markets and instruments. Individual savers and borrowers who lack financial education, expertise, or access may incur significant fees as a result of these factors. The costs of participation may be reduced by financial intermediaries by providing consumers with standardised goods and services that are tailored to meet their unique requirements and preferences. In addition to this, they provide advise, education, and direction on the most effective ways to make choices regarding one's financial situation. The theory of financial intermediation investigates the ways in which financial intermediaries promote financial inclusion and literacy by decreasing participation barriers and providing financial possibilities for both people and businesses.

The regulation of financial intermediaries by the government or by other agencies is another topic that is investigated under the financial intermediation theory. The goals of financial regulation are to guarantee that financial intermediaries conduct their business in a safe and sound way, to safeguard the interests of clients and investors, to encourage fair competition and innovation, and to contribute to the continued development and stability of the economy. The theory of financial intermediation examines the advantages and disadvantages of many types of regulation, including capital requirements, deposit insurance, supervision, disclosure, consumer protection, and macroprudential policies, among others. In addition to this, it analyses how the behaviour and performance of financial intermediaries, as well as their effect on the economy, are influenced by regulation (Zuo, Strauss, & Zuo, 2021).

The theory of financial intermediation is a vast and varied area that examines many facets of the part that financial intermediaries play in the economy as well as the services that they perform. It sheds light on the ways in which financial intermediaries generate value for savers and borrowers by offering services such as liquidity, monitoring, enforcement, and involvement in financial transactions. In addition to this, it investigates the ways in which the authorities regulate financial intermediaries to guarantee both their safety and soundness as well as the contribution they make to economic wellbeing (Appiah-Otoo & Song, 2021).

2.2 Prior Related Research Papers

Intelligent finance was regarded as the science, technology, and art of conducting comprehensive, predictive, dynamic, and strategic analyses of global financial markets, aiming to unify and integrate academic and professional finance (Perwej, 2020). Based on the four principles of synthesis, prediction, dynamics, and strategy, intelligent finance started from the information source and introduces the time scale into the pricing process analysis to detect and capture trends, cycles, and seasonality on multiple intrinsic time scales, as the dynamic basis for building and managing investment portfolios.In contrast to traditional financial models, Internet intelligent finance offered lower entry barriers, wider public participation, and greater popularity(Abbas, Iqbal, & Aziz, 2019).

Accordingly, the fundamental nature of its financial services remained unchanged, indicating that it had not disrupted the traditional financial industry's ecosystem. Intelligent finance played a key role in achieving smart growth in intelligent regions, based on the European Commission's 20-20 agenda for regional and urban policy priorities (Haris, Yao, Tariq, Malik, & Javaid, 2019). Regarding, As financial institutions increasingly invest in the intelligence field, intelligent finance was witnessing noteworthy developments in payment, blockchain technology, artificial intelligence language technology, and critical financial processes. It has been widely applied in bank customer identification, operation management, and risk prevention and control, providing customers with more convenient and personalized services. Intelligent finance is poised to break through the barriers to realizing genuine inclusive finance and progressively move to the forefront of business operations. These programs would train students in accounting principles and information technology and integrate information technology into business accounting teaching practices(Yang & Zhang, 2020).

Internet financial intelligence is a phrase that refers to the use of data science and artificial intelligence (DSAI) methods to improve the operations, services, and performance of financial institutions and markets. This may be done via the use of the internet. Internet financial intelligence may provide financial institutions the opportunity to increase their productivity, profitability, level of innovation, and level of pleasure of their customers by using information technology and large amounts of data. Internet financial intelligence may also assist financial institutions deal with the problems and possibilities offered by the fast expansion of internet-enabled financial services, such as mobile banking, third-party payment, and peer-to-peer lending, amongst others. This can be accomplished via the utilisation of mobile banking, third-party payment, and peer-to-peer lending.

The initial point of view considers the many online financial intelligence factors. These variables are used to determine the degree to which financial institutions are able to acquire, process, and analyse data from a variety of sources and channels. Some examples of these sources and channels include internal databases, external websites, social media platforms, mobile apps, cloud services, and so on. These variables are also used to quantify the breadth and variety of data sources and channels that financial institutions, such as clients,

products, markets, and regions, are able to access and use. Examples of these include: markets, regions, and products. In addition, these variables are used to gauge the amount of complexity and automation of data analysis and decision making that financial institutions are capable of achieving. Examples of sophisticated data analysis and decision making include machine learning, natural language processing, computer vision, deep learning, transfer learning, federated learning, and many more.

The second point of view considers how the availability of financial information on the internet impacts the profitability of banks. The profitability of a financial institution is an essential measure of both its performance and its capacity to remain in business. The profitability of a bank may be determined using a number of criteria, including return on equity (ROE), return on assets (ROA), nett interest margin (NIM), and others. Internet financial intelligence may have an effect on bank profitability in a variety of ways, including the reduction of costs, the augmentation of revenues, the control of risks, and the introduction of new products and services.

The term "cost reduction" refers to the ability of online financial intelligence to assist banks in lowering their operating expenses. This is accomplished via the automation of data collecting, processing, and analysis; improvements in operational efficiency and accuracy; and optimisation of resource allocation. The term "revenue enhancement" refers to the ability of online financial intelligence to assist banks in increasing their revenues via the acquisition of new customers, the provision of individualised goods and services, the improvement of client loyalty and happiness, and the development of innovative business models. Internet financial intelligence may assist banks in better managing their risks by assisting in the improvement of their credit scoring models, the detection of frauds and anomalies, compliance with rules and standards, and the enhancement of their resilience and security. Internet financial intelligence has the potential to assist banks in innovating their goods, services, and procedures by assisting in the discovery of new patterns, insights, and possibilities from data; developing new value propositions for clients; and cooperating with other players in the ecosystem.

The third point of view examines the difficulties that must be overcome and the ways in which online financial intelligence research will develop in the future. Research on the financial intelligence of the Internet is still in its infancy, making it a relatively young

and developing subject that confronts a great deal of competition as well as several potential for expansion. Data quality, data privacy, and data security are some of the primary concerns that need to be addressed. In this context, "data quality" refers to the quality of the data sources and channels that are used to assess and develop online financial intelligence. The quality of these data sources and channels is essential to the validity and trustworthiness of the findings. On the other hand, problems with data quality such as incompleteness, inconsistency, inaccurateness, and bias are frequent in the environment of the internet, and it might be challenging to find solutions to these problems.

When we talk about data privacy, we imply that protecting the anonymity of data subjects and owners who are participating in online financial intelligence research is crucial to ensuring the study complies with ethical and legal standards. On the other hand, problems with data privacy, such as unauthorised access, disclosure, and abuse of data, are common on the open and dispersed platform that is the internet, and they are difficult to avoid. The safety and integrity of the data depends on the security of the data sources and channels that are used to measure and improve online financial intelligence. Data security refers to the fact that the security of these data sources and channels is essential for the protection of the data. In contrast, data security vulnerabilities in the susceptible and linked internet network, such as hacking, manipulation, and theft, are common and difficult to detect(Bu, Li, & Wu, 2022).

Integration of data, creativity with data, and cooperation on data projects are three of the most significant potential. The term "data integration" refers to the process in which different data sources and channels, which are used to monitor and improve online financial intelligence, are combined. This is important for ensuring that the data is both complete and diverse. However, chances for data integration, such as cross-domain, cross-platform, and cross-border integration, are uncommon in the fragmented and isolated internet environment, and they are not being taken advantage of. The term "data innovation" refers to the process in which new data sources and channels are developed in order to measure and improve online financial intelligence. This process is beneficial for the originality and value of the data since it creates new opportunities. On the other hand, prospects for data innovation such as new-generation, new-type, and new-form are

few in the conventional and conservative internet culture, and they are mostly untapped. The term "data collaboration" refers to the sharing and co-creation of data by data subjects and owners who are engaged in online financial intelligence. This kind of cooperation is advantageous for both the sharing and co-creation of data. In contrast, chances for data cooperation such as multi-stakeholder, multi-disciplinary, and multi-level projects are uncommon and undeveloped in today's individualistic and competitive online culture.

The following are some of the prospective future study avenues that have been mentioned by relevant academics in relation to Internet financial intelligence:

The quality of the data should be improved by developing procedures and techniques, such as data cleaning, data validation, data rectification, and data debiasing. These may be used to improve the quality of the data sources and channels that are used to measure and increase Internet financial intelligence. Protecting the privacy of data subjects and owners participating in Internet financial intelligence requires the development of methods and techniques, such as data encryption, data anonymization, data aggregation, and data obfuscation, among others. Improve the security of the data by developing new techniques and technologies, such as data authentication, data validation, data backup, and data recovery. These may be used to improve the safety of the data sources and channels that are used to measure and improve the quality of Internet financial intelligence. Developing strategies and procedures to ease the integration of data sources and channels for measurement is part of the data integration facilitation work.

CHAPTER 3
RESEARCH METHODOLOGY

This chapter presents four topics, including population and data samples, data sources and data collection, variables definitions and statistical analysis. The details of each topic are described below.

3.1 Population and Data Samples

The population of the study was banks in China. Because of unavailable data, finally, the study employs 27 commercial banks from 2014 to 2021 as samples, including 6 large commercial banks, 8 city commercial banks, 7 joint-stock commercial banks, and 6 rural commercial banks. Finally, the research totally included 216 observations. The bank samples are shown in Table 1 below.

Table 3.1 List of bank samples

No.	Bank name	Bank type
1	Agricultural Bank of China Limited	Large commercial banks
2	Bank of Beijing Co., Ltd	City commercial Bank
3	Bank of Chengdu Co., Ltd	City commercial Bank
4	Bank of China Corporation Ltd	Large commercial banks
5	Bank of Communications Co., Ltd	Large commercial banks
6	Bank of Hangzhou Co., Ltd	City commercial Bank
7	Bank of Qingdao Co., Ltd	City commercial Bank
8	Bank of Shanghai Co., Ltd	City commercial Bank
9	Bank of Xi'an Co., Ltd	City Commercial Bank
10	Changsha Bank Co., Ltd	City Commercial Bank
11	China CITIC Bank Limited	Joint-stock commercial bank
12	China Construction Bank Corporation	Large commercial banks
13	China Everbright Bank Limited	Joint-stock commercial bank
14	China Merchants Bank Co., Ltd	Joint-stock commercial bank
15	China Minsheng Bank Co., Ltd	Joint-stock commercial bank

Table 3.1 List of bank samples (Cont.)

No.	Bank name	Bank type
16	Chongqing Rural Commercial Bank Co., Ltd	Rural Commercial Bank
17	Guiyang Bank Co., Ltd	City Commercial Bank
18	Hua Xia Bank Co., Ltd	Joint-stock commercial bank
19	Industrial and Commercial Bank of China Limited	Large commercial banks
20	Industrial Bank Co., Ltd	Joint-stock commercial bank
21	Jiangsu Changshu Rural Commercial Bank Co., Ltd	Rural Commercial Bank
22	Jiangsu Jiangyin Rural Commercial Bank Co., Ltd	Rural Commercial Bank
23	Jiangsu Zhangjiagang Rural Commercial Bank Co., Ltd	Rural Commercial Bank
24	Jiangsu Zijin Rural Commercial Bank Co., Ltd	Rural Commercial Bank
25	Ping An Bank Co., Ltd	Joint-stock commercial bank
26	Postal Savings Bank of China Co., Ltd	Large commercial banks
27	Qingdao Rural Commercial Bank Co., Ltd	Rural Commercial Bank

3.2 Data Sources and Data Collection

The data collection of three internet financial intelligence variables is mainly retrieved from Taian Financial Database (CSMAR). The characteristics of banks variables, including return on equity (ROE), bank size, leverage and book to market value ratio are retrieved from annual financial information and calculations.

3.3 Variable Definitions

After literature review, researchers employed three variable groups as below.

3.3.1 Dependent variable:

This study employed return on equity as a proxy of banks profitability. Profitability (ROE), which is computed as the ratio of each bank's net income to its average shareholders' equity. If a bank's return on equity (ROE) is high, then the bank is profitable.

3.3.2 Explanatory variables

The aim of the study is to examine the impact of financial intelligence on bank profitability. Thus, explanatory variables were three dimensions as:

The depth index, abbreviated as "DEPTH," is a variable that evaluates the extent to which internet financial intelligence may be accessed in terms of the amount and diversity of online financial goods and services that are made available by banks. It is determined by adding up all of the points that are allotted to each good or service according to the degree of difficulty and originality that they provide. When the depth index of a bank is greater, it indicates that the institution's online financial products are more varied and complex. This allows the banks to provide more individualized goods and services, which in turn boosts customer happiness and loyalty. Data mining and machine learning are two more methods that banks may employ to identify fraudulent activity, thwart cyberattacks, and improve risk management. These skills may assist financial institutions in increasing their income, enhancing their innovation, lowering their expenses, and improving their operational efficiency.

The term "breadth of coverage," often known as "RANGE," refers to the degree to which financial institutions gain the advantage of internet-enabled technology to broaden both their market reach and their client base. The variable indicates the breadth of internet financial intelligence in terms of the number of clients and the fraction of transactions that are completed online. The ratios of a bank's online customers to their total customers and the ratio of their online transactions to their total transactions are both used in the calculation of this metric. When it comes to a bank's online financial reach, the breadth of coverage is directly correlated to how broad and all-encompassing it is. A greater breadth of coverage suggests that banks have more diverse and inclusive ways to distribute their goods and services.

This variable assesses the degree of online financial intelligence, known as the INDEX, in terms of the application of artificial intelligence (AI) and data analytics to improve financial decision making and customer experience. The index value ranges from 0 to 100. It is computed as the total of the scores that are provided to each AI application or data analysis method used by banks depending on the amount of complexity and influence each of those applications and techniques have. When a bank's customers have a greater degree of intelligence, the bank's online financial solutions are more intelligent and tailored to their specific needs.

3.3.3 Control variables

The study employed three control variables. The details are explained below.

The leverage ratio (LEV) is a variable that is used to assess the degree of leverage that banks have in terms of their debt-to-equity ratio. This ratio is derived by comparing a bank's total liabilities to the entire amount of shareholders' equity that the bank has. When a bank's leverage ratio is greater, the institution's total debt level is also higher.

Firm size (Size) is a variable that gauges the size of banks based on the natural logarithm of each bank's total assets. This variable is referred to as the firm size. The greater the size of the company, the more significant a bank is.

Book to market value ratio (BM): This variable assesses the market valuation of banks based on their book to market value ratio, which is determined as the ratio of book value per share to market value per share for each bank. In other words, it compares the book value of each share to the market value of each share. The ratio of a bank's book value to its market value should be as low as possible for it to have a high market value.

The proxies of each variable are shown in Table 2 below.

Table 3.2 The mnemonics and definitions of variables

Variables	Mnemonic	Definition
Dependent variable		
Return on equity	ROE	Net profits / Equity
Independent variable		
1. Depth index (DEPTH)	DEPTH	The index reflects the number and amount of people who continue to use the internet intelligent finance in terms of finance big data to reduce information asymmetry.
2. Breadth of coverage (RANGE)	RANGE	The index reflects the variety of internet intelligent finance.

Table 3.2 The mnemonics and definitions of variables (Cont.)

Variables	Mnemonic	Definition
Dependent variable		
Return on equity	ROE	Net profits / Equity
Independent variable		
	INDEX	
3. Degree of intelligence (INDEX)		The index reflects the convenience, low- cost and credibility of internet intelligent finance.
Control Variable		
1. Bank size	SIZE	Natural Logarithm of firms' total assets
2. Leverage ratio	LEV	Total debt / Total asset
3. Book to market value ratio	BM	Total assets / Market value

3.4 Statistical Analysis

This study employed quantitative analysis in terms of descriptive statistics and inferential statistics.

Descriptive statistics were employed to examine the minimum, maximum, mean, and standard deviation of variables.

Inferential Statistics were employed to examine the relationship of variables by using Pearson's Product Moment Correlation Coefficient and Variance inflation factors (VIF). In addition, multiple regression was also employed to examine the impact of explanatory variables on dependent variables.

The specification model was:

$$ROE_{i,t} = \beta_0 + \beta_1 DEPTH_{i,t} + \beta_2 RANGE_{i,t} + \beta_3 INDEX_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 BM_{i,t} + \varepsilon_{i,t}$$

Where, i and t denote i and year t, respectively. $\varepsilon_{i,t}$ is error term for individual i in year t.

Multiple linear regression is the primary method of analysis that was used to this study. This statistical method gives us the ability to investigate the extent to which a dependent variable, in this instance the return on equity, is affected by a group of independent factors, such as the depth index, breadth of coverage, degree of intelligence, leverage ratio, business size, and book to market value ratio. When running multiple linear regression, SPSS gives a number of choices and outputs, such as model summary, ANOVA table, coefficients table, residuals statistics, collinearity diagnostics, and model fit statistics. These are just some of the possibilities. The hypotheses may be tested with the aid of these outputs, and the research questions can be answered.

The study also makes use of correlation analysis as an additional method of analysis. A statistical method that assesses the degree and direction of a linear link between two variables is called a correlation coefficient. When doing correlation analysis, SPSS offers users with a number of different choices and outputs, such as the Pearson correlation coefficient, the Spearman rank correlation coefficient, the significance level, scatterplots, and cross-tabulations. With the use of these outputs, we are able to investigate the connections between the variables and locate any potentially confusing circumstances.

SPSS also gives us the ability to interact with open-source programming languages like R and Python by providing us with a library of extensions that we may use or by letting us construct our own. This makes it possible for us to improve the SPSS syntax by adding more functions and capabilities that are not currently offered by SPSS. For instance, we might utilise the programming languages R or Python to carry out more sophisticated methods of data processing, visualisation, or machine learning on our data.

CHAPTER 4
EMPIRICAL ANALYSIS

This chapter presents four topics, including population and data samples, data sources and data collection, variables definitions and statistical analysis. The details of each topic are described below.

4.1 Research Results
The results of the study included 3 major parts, starting with descriptive statistics, then multicollinearity and multiple regression. Each part is shown below.

4.2 Descriptive statistics
The results of descriptive statistics are reported in Table3 below.

Table 4.1 Descriptives Statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
ROE	0.0634	0.2369	0.1316	0.0361
Depth	28.6700	115.9852	72.5833	14.1738
Range	7.7200	14.1600	10.3319	1.5273
Index	0.5100	2.9000	1.3946	0.4148
LEV	0.3258	0.7851	0.6430	0.0715
SIZE	51.0700	33345.0600	5665.1855	7560.7301
BM	0.0048	0.0167	0.0092	0.0022

From Table3, the maximum and minimum of bank profitability were 0.1316 and 0.0634 respectively and its means of 0.1316. This implies that no bank suffers from operating loss during 2014 – 2021. The debt index provided the maximum and minimum were 115.9852 and 28.6700 respectively and its means of 72.5833. This reflects that the number and amount of people who continue to use the internet intelligent finance were quite volatility in China. The breadth of coverage index provided the maximum and minimum were 14.16 and 7.72 respectively and its means of 10.3319. This reflects that

the number and amount of people who use internet intelligent finance in terms of variety platform payment or transaction were quite high in China. The degree intelligence index provided the maximum and minimum were 2.90 and 0.51 respectively and its means of 1.3946.

This reflects that the number and amount of people who use internet intelligent finance in terms of convenience, low- cost and credibility of internet intelligent finance were quite small number in China. Bank leverage showed the maximum and minimum were 0.7851 and 0.3258 respectively and its means of 0.6430. This reflects that most banks contained higher debt financing than equity financing, which is the nature of banking industry (Niemand, Rigtering, Kallmünzer, Kraus, & Maalaoui, 2021). Obviously, Bank size showed the maximum and minimum were 33345.0600 and 51.0700 respectively and its means of 5665.1855. This reflects that bank size were quite different because of variety type of banks in China. The book to market value ratio showed the maximum and minimum were 0.0167 and 0.0048 respectively and its means of 0.0092. This reflects that most bank in China had market value higher than book value, implying the high business value of Chines banks(Haris et al., 2019).

4.3. Multicollinearity

To examine the relationship of variables, Pearson correlation and Variance inflation factor (VIF) was used for checking Multicollinearity. The results were presented in Table 4 below.

Table 4.2 Correlation Coefficient between Variables

VIF		ROE	Depth	Range	Index	LEV	SIZE	BM
	ROE	1						
2.163	Depth	-.492**	1					
1.468	Range	-0.052	-0.005	1				
1.275	Index	-.365**	.337**	.196**	1			
2.247	LEV	-.337**	.690**	-.201**	.262**	1		
1.032	SIZE	-0.125	0.033	0.125	0.003	-0.025	1	
1.332	BM	.783**	-0.133	.355**	-.156*	-0.010	-0.054	1

**. Correlation is significant at the 0.01 level

*. Correlation is significant at the 0.05 level

There is no multicollinearity between the explanatory factors, according to Table 4, which shows the findings of the correlation analysis of all variables. All Pearson correlation coefficients falling below the crucial level of 0.80 serve as a sign of this. When two or more variables in a regression model are closely linked, a phenomenon known as multicollinearity is suggested by high correlation coefficients, which are often over 0.80. By distorting the standard errors and p-values, making the model estimates unstable, and perhaps leading to incorrect inferences about the connection between the independent and dependent variables, multicollinearity may seriously impair the interpretability and reliability of regression models.

The Variance Inflation Factor (VIF), another crucial diagnostic tool to identify multicollinearity, is likewise below the generally recognized threshold of 10 for all explanatory variables in addition to the Pearson correlation coefficients. VIF measures the degree to which multicollinearity increases the variance of the calculated regression coefficient. A VIF score more than 10 is often viewed as showing significant multicollinearity. A VIF of 1 implies no association between the predictor and the other variables (Chen et al., 2021).

4.4. Multiple regression

The specification model for the study was:

$$ROE_{i,t} = \beta_0 + \beta_1 DEPTH_{i,t} + \beta_2 RANGE_{i,t} + \beta_3 INDEX_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 BM_{i,t} + \varepsilon_{i,t}$$

Where, i and t denote i and year t, respectively. $\varepsilon_{i,t}$ is error term for individual i in year t.

The regression results showed the effect of explanatory variables on bank profitability shown in Table 5 below.

Table 4.3 Regression Results

	Unstandardized Coefficients	t	Sig.
C	0.2296	25.250	0.000
Depth	-0.0004**	-5.679	0.000
Range	-0.0103**	-18.493	0.000
Index	-0.0004	-0.191	0.849
LEV	-0.1530**	-10.435	0.000
SIZE	0.0000	-1.220	0.224
BM	14.9676**	40.751	0.000
Adjusted R^2	0.922		
F-statistic	409.855**		
Observations	216		
Dubin-Watson	1.767		

Note: Dependent Variable: ROE

**. Correlation is significant at the 0.01 level

*. Correlation is significant at the 0.05 level

The purpose of the multiple regression analysis that was carried out as part of this research was to explore the impact that online financial intelligence has on the profitability of banks in China. The findings of the regression analysis revealed that F-statistics provided significant statistics at the 0.01 level, implying that the model is fit. The adjusted R2 valued 0.922, implying that the explanatory variables that were included in the model were responsible for explaining bank profitability approximately 92.20 percents. The findings of the regression indicated that the depth index (DEPTH) and breadth of coverage (RANGE) had a substantial negative influence on bank profitability. This was shown by the fact that both the negative coefficients and significant t-values appeared in the results of the regression. According to these studies, it seems that financial institutions that have more depth and breadth of online financial intelligence likely to have lower levels of profitability. Surprisingly, the degree of intelligence (INDEX), the index reflecting the convenience, low- cost and credibility of internet intelligent finance, provides insignificant statistics, reflecting that the degree of intelligent did not affect on bank profitability.

At the 0.01 level, the leverage ratio showed a substantial negative influence on bank profitability, indicating that greater levels of leverage would also have a detrimental impact.As increasing borrowing may result in higher interest costs and perhaps higher default risk, both of which can have a detrimental effect on a bank's profitability, this is often linked to the risk associated with more leverage. On the other hand, at the 0.01 level, the book to market value ratio (BM) showed a considerable beneficial effect on bank profitability. This implies that a greater BM ratio could improve bank profitability. In this research, the bank's size (SIZE) did not show up as a major factor determining bank profitability (Milana & Ashta, 2021). Contrary to some of the previous research on the issue, this lack of relevance. The effect of bank size on profitability may vary among markets and locations and be influenced by a number of contextual variables, which might account for the inconsistent results of various research.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

This chapter presents four topics, including population and data samples, data sources and data collection, variables definitions and statistical analysis. The details of each topic are described below.

5.1 Study conclusion

Finding out how internet financial intelligence affects Chinese banks' profitability was the goal of this study. This research looked at important factors including the depth index (DEPTH), range of coverage index (RANGE), and index of intelligence (INDEX) to see how these online financial intelligence indicators may improve banks' profitability.

Regarding the first hypothesis (H1), our results showed a strong, although adverse, correlation between the depth index (DEPTH) and bank profitability. This unexpectedly inverse association shows that a larger DEPTH may initially result in worse profitability in the early stages of the development of financial technology. This may be related to the significant expenditures necessary for research and development in the early phases of the use of financial intelligence. These findings contradict the direction of the influence as predicted by H1, but they support the original connection assumption.

Regarding the second hypothesis (H2), the research discovered a similar trend. Bank profitability was significantly but unfavorably impacted by the breadth of coverage index (RANGE). During the early stages of the development of financial intelligence, the breadth of coverage index, which represents the range of services provided, seemed to have a detrimental effect on bank profitability. The relevance of the association is once again confirmed; however, this goes against the impact's anticipated direction in H2.

The third hypothesis (H3), which holds that intelligence (INDEX) level and bank profitability are positively correlated, was not clearly addressed in the text and would need more research.

The COVID-19 epidemic and the research period, which stretched from 2014 to 2021, provided particular potential and difficulties for the banking industry. Despite the observed short-term negative effect of DEPTH and RANGE on bank profitability, this

study implies that these parameters may have a favorable impact on profitability throughout the growth and maturity phases of financial technology development.

5.2 Discussion

The goal of the research was to determine the effect of online financial intelligence on Chinese banks' profits. The findings provide insightful information on the correlation between online financial intelligence indicators and bank profitability.

The results of the study discovered that the depth index (DEPTH) was a major variable affecting bank profitability. Unfortunately, it provided a reverse relationship between the depth index and bank profitability. This might be because bank in China were in introduction stage of the financial technology development for banking sector. For the introduction stage, all banks must invest huge funds in research and development in financial intelligence for responding to customers' needs. Concurrently, bank customers were in the introduction stage also. They must study how to use new banking technology. As a result, there might be inefficiency in using finial intelligence in the introduction stage. The same as the depth index, the breadth of coverage index (RANGE) significantly improved bank profitability in a reverse direction due to the banking sector being in the introduction stage of financial intelligence development and operation.

The research results were shown in short-term period of study during 2014 - 2021. Additionally, the study period included the Covid-19 pandemic. However, researchers can point that both the depth index and the breadth of coverage index were major factors to improve bank profitability for the following stages of the financial technology development for banking sector, including growth stages and maturity stages. Concurrently, the changes in global society because of the epidemic of Covid-19, the behavior of people in society has changed dramatically. This transformed bank customers' behavior to employ financial transaction via internet financial intelligence.

For the long-term of banking sectors, the deeper online financial information, such as a greater variety of financial services and products supplied, might help Chinese banks become more profitable. This research supports the present trend of improvements in financial technology and emphasizes the significance of offering clients a wide variety of services. Additionally, it was shown that the breadth of coverage index (RANGE)

significantly factor of bank profitability. This implies that banks with a greater selection of services, including a variety of platforms for payments and transactions, are more likely to experience increased profitability. The results show that Chinese consumers prioritize accessibility and convenience in financial transactions, and banks must adjust to these preferences to increase their profitability. Banks that efficiently use these technologies to boost productivity, save costs, and improve client experiences are more likely to succeed in the Chinese market with better profitability.

The considerable effect of online financial intelligence on the profitability of Chinese banks has been shown by this research. The results show that banks must adopt digital technology, provide a wide variety of services, and use intelligent systems to improve operations and satisfy changing client demands. Banks may increase their profitability and maintain their competitiveness in the fast-paced, technologically-driven financial environment by doing this. To further develop our knowledge of the link between online financial intelligence and bank profitability, future research should expand on these results and investigate new variables and settings.

For instance, a research by McKinsey (2022) revealed that bank profitability increased to a 14-year high in 2022, with an anticipated return on equity between 11.5% and 12.5%, driven by a strong rise in net margins as interest rates surged after years of being at low levels. This study also included a warning that more than half of the world's banks still earn less than their cost of equity and that geopolitical unrest and macroeconomic instability present serious problems for banks throughout the globe. In order to overcome these obstacles and increase their margins, Chinese banks may be able to gain a competitive edge by using online financial intelligence, according to our study.

Chhaidar et al.'s (2022) research, which looked at the dynamic link between fintech investments and financial performance in 23 European banks from 2010 to 2019, is another important one. They discovered that bank profitability and fintech investments are positively and strongly correlated, suggesting that more digital involvement promotes improved performance. Additionally, they discovered that the size of the bank moderates this link, favoring bigger banks over smaller ones in the return on fintech investments. This research supports our conclusion that bank profitability in China is positively impacted by online financial intelligence measures like DEPTH and RANGE. However, our

research also shows that this effect is detrimental in the beginning stages of financial technology development for the banking industry, meaning that it may not apply to European banks with more advanced digital capabilities.

This research exclusively employed Chinese banks as a sample, which may have limited the generalizability of our results to other nations or areas with varying degrees of development and use of online financial intelligence. Future studies might broaden the analysis's focus to include more developing or emerging economies and contrast their findings with ours.

Only DEPTH and RANGE were employed in our analysis as online financial intelligence indicators. Other features or dimensions of online financial intelligence, such as quality, security, innovation, or customer pleasure, might, nevertheless, have an impact on bank profitability. Future studies might investigate these extra variables and look at how they affect DEPTH and RANGE to affect bank performance.

The limited time frame of our analysis, from 2014 to 2021, may not have adequately captured the long-term patterns or impacts of online financial intelligence on bank profitability. Future studies may broaden the analysis's temporal range to take into account more current data or project future events using simulations or historical trends.

5.3 Study Recommendations

5.3.1 Countermeasures for bank operating cost management

1) Establish a big data information processing system

The Internet is not only one of the technological supports for the rapid growth of Internet intelligent finance, but it has also given us a new age in which data is stored on the cloud. Internet-based intelligent finance is dependent on the big data approach, which consists of massive amounts of information, rich content, low value density, and high processing speeds. Commercial banks should make excellent use of the integration, statistics, analysis, and analysis of connected data and information gathering brought about by Internet intelligent finance. This should not simply be utilised for Internet smart finance. In order to evaluate the financial standing of bank clients and the level of risk involved, Therefore, the selective targeting of information about value, Make up for the deficiencies of commercial bank information lag in order for commercial banks to increase

their capacity for risk management, as well as to detect and lower the percentage of loans that are considered to be non-performing. This may be accomplished by using the speedy and direct qualities of Internet intelligent finance.

Because Internet intelligent finance combines aspects of the Internet with traditional finance, it is able to swiftly and freely develop financial services in real time and across several technological platforms. Due to the information lag and sluggish reaction due to the particularity of the business, commercial banks may take the opportunity to enhance the records of non-performing loans, avoid the occurrence of non-performing loans, and guarantee that the safety of its money is maintained.

2) Improve the risk management mechanism

At the moment, from the viewpoint of the external environment, the Internet intelligent financial risk regulation is still at the beginning of the exploration. Countries are actively preventing Internet intelligent financial risk policy, and commercial Banks are expected to actively participate in the policy formulation process, provide constructive opinions, and transition from "passive copycat" to "active control" in order to timely grasp the policy guidance and nip the problem in the bud. First, when considering the situation from the point of view of commercial banks, commercial banks have the ability to establish a distinct Internet intelligent financial risk control department that will report directly to the bank risk control department. The Internet Intelligent Financial Risk Control Department is developed on the basis of the viewpoint of risk management of commercial banks themselves, in compliance with relevant national rules and policies of banks, and taking into consideration the unique characteristics of Internet intelligent financial hazards. However, despite its subordination to the risk management department of commercial banks, it maintains a significant degree of autonomy.

On the one hand, it is important for the bank to prevent Internet intelligent financial risk, establish Internet intelligent financial risk control mechanism, and improve the risk early warning ability; on the other hand, it provides a guarantee for the bank in the field of Internet business, helps the bank Internet industry product innovation, and it will provide a new risk management measure that is not only conducive to the bank's overall risk management, but also for the b. There is a continuous emergence of new technical methods within the realm of internet-based intelligent finance; the rate of replacement

for emerging technologies is also rather rapid, and the majority of technologies, on their own, do not constitute complete solutions.

The risk management component of Internet-based intelligent finance requires an analysis of developing technologies in order to identify and mitigate possible dangers. Internet innovation, of course, the speed; although commercial Banks cannot the Internet intelligent financial future development model, development direction of accurate prediction; however, independent Internet intelligent financial risk control department, starting from the nature of banking financial business, through the depth and breadth of research, can provide for the future development of a reference point. Second, commercial banks need to pay attention to the dangers that network technologies pose to data security and develop technologies that have their own independent intellectual property rights. The majority of the threats to network security come from the machines themselves, as well as from phishing websites, network hacker assaults, and other similar threats. The local effect that it has on the typical business that commercial banks do is far less than the potential loss that might occur due to security threats associated with Internet-based intelligent finance. In addition, the commercial bank's online payment and other businesses primarily rely on U shield external manufacturers to provide security. This means that there are bound to be some risks involved. In order for commercial banks to truly participate in the Internet intelligent financial sector, they need to have independent intellectual property rights, improve their core competitiveness, and only if they have mastered their own technology will they be able to weave their own safety nett. This is necessary not only to be able to compete with future rivals but also to survive in the long Establishing their own postdoctoral research departments, developing and cultivating people in this sector, and doing a good job in terms of the prevention of safety technology should all be priorities for commercial banks, which should devote a significant amount of human, financial, and material resources. At the same time, they should enhance their collaboration with research institutions and outstanding Internet businesses, extract the valuable aspects while discarding the less important aspects, and develop autonomous intellectual property technology.

5.3.2 Regional balance countermeasures

Liquidity is the balance between safety and profitability leverage, commercial Banks insufficient liquidity will appear liquidity risk, lack of liquidity will make the safety of commercial Banks lose security, and excess liquidity will reduce the profitability of commercial Banks, maintain appropriate liquidity, is crucial for the sustainable development of commercial Banks. Due to the Internet intelligent financial can set a variety of business, convenient and quick payment method by many young people like, and ali balance treasure suning treasure change such as the emergence of the "baby" corps, relatively high returns and shunt the bank part of the Internet intelligent financial deposits in payment and settlement, deposits, financing and customer resources for liquidity, the liquidity of commercial Banks will be affected.

1) Change the business philosophy, improve the service quality, and enhance the customer stickiness

The deposits of commercial banks may seem to be diverted by Internet intelligent finance at first glance; nevertheless, it is not straightforward to discover that the bulk of Internet intelligent finance diversion is a significant number of demand deposit customers rather than the "traditional customers" of commercial banks. For instance, Yu'ebao may be utilised to purchase money market funds, and the bank agreement deposits sector is the most significant investment direction for money market funds. In other words, the majority of the money that customers placed in Yu'ebao has made a U-turn and returned to the banking system.

This is partly due to the structural advantages that commercial banks have as special companies. Therefore, first and foremost, commercial Banks need to change their "account-centered" traditional business philosophy, as soon as possible to abandon the long-term monopoly superiority, learning to use the Internet intelligent financial thinking from the perspective of customers, truly "all to the customer-centered", understand the needs of the customer, on the premise of customer demand, innovation launched differentiated financial products and services, and fundamentally value-added products and services. Second, commercial Banks should make full use of modern communication technology and mobile equipment, improve the bank network social platform, through WeChat, QQ directly communicate with customers, to improve consumer experience comfort, simplify

the process, improve efficiency, change people's consistent concept of Banks, consumers should reduce costs, improve the quality of the effect, and large commercial Banks should use their outlets, the advantage of abundant funds, to the advantage of small and medium-sized businesses.

2) Strengthen the cooperation between banks and reduce customer costs

Due to its convenient payment procedures, Internet intelligent finance competes for and settles the payment and settlement business with lower or even free payment fees of commercial banks, which affects the liquidity of commercial banks. In order to cope with this impact, commercial banks should strengthen inter-bank cooperation between banks and reduce the flow cost of inter-bank transfer of customer funds. In the short term, it may reduce the income of the intermediary business of commercial banks, but in the long term, it will enhance the stickiness of customers' funds and maintain liquidity.

(3) Strengthen cooperation with Internet enterprises for win-win results

It is important for commercial banks to stay current with current events, increase their level of collaboration with businesses operating online, and make use of new information technology in order to reinvent their goods and services. Internet businesses lack the customer resources and risk management mechanisms of commercial banks, which are both of a higher quality. This is one of the areas in which commercial banks excel. Internet businesses are equipped with cutting-edge information technology and rich data on the satisfaction of their customers; this provides commercial banks with a crucial competitive advantage. Both parties work together, increase the extent of their collaboration, and find a solution that benefits both of their interests. When it comes to the provision of online credit, commercial banks and internet businesses may work together. Internet firms have access to a massive amount of data, but their finance options are restricted. Commercial banks also have considerable financial strength, but much of their business is in the form of smaller loans. With commercial locations across the whole of the nation, Numerous different avenues of financial support, Should work together with enterprises that operate on the Internet to produce loan solutions that are suited to the environment of the network, Customers should be encouraged to purchase appropriate financial products. Utilising the cutting-edge information technology of Internet businesses in order to circumvent the issue of network credit verification and the

fundamental technology of remote account opening in the context of the loan approval process, as well as combining the expertise of large loan approvals developed by commercial banks with the data of customer online transactions mastered by Internet businesses, the advanced information technology of Internet businesses can break through these roadblocks. Gain knowledge from one another, Alter and enhance the way the risk management system works, Raise the interest rate on the loans; cut down on the proportion of bad loans; In order to attain a shared development

4) Formulate a reasonable interest rate pricing system to achieve sustainable development

From an objective standpoint, it can be said that Yu ebao and the other "babies" in Yu ebao are experiencing a decline in their levels of income. It is important for commercial banks to look at things from the point of view of their clients, take into account their own growth, and devise a price management system for interest rates that is appropriate. In the short term, platforms with high deposit interest rates and low loan interest rates can attract more depositors and borrowers. However, in the long term, this is not conducive to the healthy and sustainable development of enterprises. On the other hand, platforms with low deposit interest rates and high loan interest rates find it difficult to attract depositors and borrowers, which will have an effect on the scale of deposits and loans and, consequently, the ability to operate. As a result, the establishment of a system for the effective pricing of interest rates is a matter of pressing concern for commercial banks. Commercial Banks should not only take into account the current macroeconomic climate, market liquidity, and other aspects of the external environment; they should also strive to combine the growth of the internal environment and learn from the experiences of other developed nations. For the sake of maintaining the bank's liquidity and the bank's long-term growth, financial institutions should work to enhance the pricing method, cut down on price and risk mismatch losses, and build an interest rate pricing management system that is both rational and practical.

5.3.3 Countermeasures to industry profitability

The need of safety comes first, and the connection between profitability and safety is achieved via liquidity. Commercial banks are a unique kind of business that, before everything else, must ensure customers' safety and liquidity. However, a commercial

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bank is also a business, and the overarching objective of its operations is to generate profits and advance its own interests to the greatest extent possible. Although the fast growth of Internet-based intelligent finance built the commercial bank network management model and expanded the number of new profit channels, it nevertheless managed to have a negative impact on the profitability of commercial banks.

The commercial banks' primary source of revenue comes from their conventional and intermediate businesses. Banks, in the current day, the conventional bank business problem, intermediate business is being squeezed, and in order to deal with the effect, commercial Banks may start from the following aspects.

1) Innovate intermediate business and expand revenue sources

The development of the Internet intelligent financial, the third-party payment platform is to give different commercial bank card online payment to provide a convenient payment platform, but with the development of information technology, the Internet intelligent financial business has been extended to credit intermediary, withholding and other business, Internet intelligent financial business scope from the financial sector hit all aspects of people's life is similar to Internet payment business, the rise of the Internet financial products on a commission basis, because of its low threshold, simple and convenient, provides investors except bank of an investment choice, attracted a lot of investors, commercial bank earnings losses. In terms of payment business, commercial banks should strive to reduce transaction costs and truly realize inclusive finance.

2) Increase the investment in talents and build a team of high-quality talents

The growth of commercial banks, whether as conventional businesses or as intermediate businesses, is inseparable from the investment of skills, which are the fundamental and most significant resource for the development of companies. Whether commercial banks are developed as traditional businesses or as intermediate businesses. At the moment, the talent structure of commercial banks is mostly composed of skills in economics and management. There is a dearth of talents in information technology, as well as compound talents that combine economic management and information. The majority of candidates for jobs at big banks prefer to major in economics and management, which is reflected in the recruiting brochures of such institutions.

Commercial banks pay very little attention to individuals with expertise in computer technology. As a consequence of this, experts working in information technology make up a relatively insignificant fraction of the banking industry's talent pyramid. Although some financial institutions have established a specialised department for information technology, the majority of financial institutions have not done so. Of the financial institutions that have established such a department, the department's voice is seldom heard and it is unable to play a significant part. Due to a lack of skill in information technology, we are unable to understand the most recent trends in the development of information technology, much alone make use of the most recent information technology. The newly produced financial goods will not be able to keep up with the trend of the market and will fall behind; moreover, it will be difficult to satisfy the requirements of the general public. Do not pay attention to people with abilities in information technology since this might potentially raise the operational risks that the company faces, which is not favourable to risk control. Therefore, commercial banks should increase the cost of talent investment, pay attention to the training of information technology talents, enhance the discourse power of information technology departments, improve the status of information technology talents, and simultaneously strengthen the training of information technology related knowledge of economic and management talents, expand the team of compound talent team, and optimise the structure of bank talent team. Commercial banks should also consider optimising the structure of bank talent teams.

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