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Impact of Digital Economy on the Profitability of Urban Commercial Banks: Evidence from China

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Abstract
With the rapid development of digital technology and widespread Internet access, digital economy is gradually becoming a cornerstone to promote global economic growth. Promoting the high-quality development of urban commercial banks is highly important to avoid systemic risks and ensure financial security. Whether digital economy can become the driving force for the development of urban commercial banks remains to be discussed. This paper focuses on urban commercial banks and adopts two-way fixed effects (TWFE) models to examine the impact of digital economy on the profitability and operational risks of urban commercial banks. The results indicate that, firstly, digital economy can significantly enhance the profitability of urban commercial banks and reduce operational risks; Secondly, lags exist in the impact of digital economy on urban commercial banks, and there are heterogeneous impacts in different quantiles. We believe that urban commercial banks should actively face the development of digital economy and take the advantage of the convenience brought by digital economy to develop themselves. In addition, urban commercial banks should expand their diversified businesses, use digital technology to reduce costs, improve asset quality, and strengthen their risk management.

Keywords
digital economy, urban commercial banks, profitability

1.Introduction

1.1 Research Background

With the rapid advancement of digital technology and widespread Internet access, digital economy has emerged as a new driving force for global economic development (Zhao et al., 2020). Digital economy, rooted in digital technology and facilitated by information and networking tools for production, distribution, consumption and management, is rapidly reshaping the world economy at an unprecedented pace and scale. This trend not only promotes the upgrading of industrial structures, but also spawns numerous emerging businesses, injecting continuous vitality into the economy. In the new era of digital economy, industries are actively exploring how to utilize digital technology to enhance efficiency, innovate services, and expand markets, and without doubt the banking industry is no exception. From 2019 to 2024, China has issued many policies in the field of financial technology (fintech) to set clear standards for the industry, aiming to stimulate innovation in financial services, enhance efficiency and convenience, reduce potential risks and safeguard consumer

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rights. The guidance provided by the People's Bank of China and other departments outlines the direction for fintech work over the next five years to promote healthy and orderly development. Currently, China is focusing on the further implementation of the 14th "Five-Year National Informatization Plan", in which keynotes lie in providing clear guidance for the digitalization of financial institutions, prompting technological investment, optimizing business processes, and innovating services. Government also emphasizes the importance of accelerating the construction of modern information infrastructure, especially advancing initiatives like 5G and industrial Internet, to provide more stable network support for the digital development of the financial industry. These measures collectively constitute a solid foundation for the development of fintech in China (Gu and Jiang, 2021; Wang, 2023).

As digital economy flourishes, cutting-edge technologies such as fintech, blockchain, and artificial intelligence continue to emerge, offering unprecedented business opportunities for the banking industry. To seize these opportunities, banks can actively engage in deep collaboration with technology companies to drive fintech innovation collectively, further expanding their business scope and offering more innovative and convenient financial products and services. Through this approach, banks can not only meet the increasingly diverse market demands but also enhance their competitiveness and market share, achieving sustainable development. However, digital economy also brings new challenges to banks, such as increased sensitivity to liquidity pressure due to digital transformation (Hou and Yang, 2024), cybersecurity risks, and data breaches. These issues require close attention (Cao et al., 2022). Discussing the impact of digital economy on commercial banks is of great importance for understanding and responding to this transformation. Specifically, this impact mainly manifests in the following aspects. Firstly, with the development of digital economy, commercial banks are undergoing rapid transformation and upgrading, facing new competitive pressures and opportunities due to adaptation to market and customer demand changes. Secondly, the development of digital economy provides commercial banks with more innovative fintech tools, helping them enhance the efficiency and the quality of financial services. Finally, commercial banks need to strengthen their risk management capabilities, effectively mitigate various financial risks, ensuring the stability and security of the financial system (Jia and Liu, 2024). In summary, researching the impact of digital economy on commercial banks is essential as it can help them better grasp the opportunities and challenges of digital economy, promote the transformation, upgradation and innovative development of the financial industry (Wang, 2022).

1.2 Literature Review

In existing literature, researchers have developed theories and methodologies regarding the impact of digital finance on the development of commercial banks. Firstly, scholars have investigated the relationship between financial technology and national financial stability. It was concluded that financial technology promotes financial stability through channels such as artificial intelligence, cloud technology, and data technology (Daud et al., 2022). Secondly, there is evidence that Chinese banks have been accumulating a large number of non-performing loans and pointed out that digital transformation might help reduce non-performing loans (Yang and Masron, 2024). Finally, some scholars have used Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze data. A study showed that knowledge application (KA) and knowledge storage (KS) have a positive and significant impact on banking performance (Almuayad et al., 2024).

Another series of relevant studies lie in predictive analysis of digital transformation in commercial banks.

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Firstly, it was proposed that with the rapid development of science and technology, commercial banks mobilize technological means to make their financial service products more refined, scenario-based, and intelligent, thereby enhancing profit levels (Yang and Gao, 2024). Secondly, based on the micro-perspective of Chinese commercial banks, the implementation of asset management regulations was studied. The results showed that the implementation of asset management regulations can significantly reduce bank risks. It was also indicated that asset management regulations can reduce bank risks by improving the bank's capital adequacy ratio and enhancing its profitability, especially for non-state-owned banks. Therefore, it is necessary to continue to adhere to the orderly regulation of asset management regulations for banks, improve the level of bank capital adequacy and enhance bank profitability (Shao and Sun, 2024). Finally, it was suggested that commercial banks should optimize and improve their strategies and suggestions based on the current development of fintech. This includes actively introducing and nurturing fintech talents, strengthening cooperation with fintech companies, planning and developing fintech based on their own needs, as well as enhancing and improving the fintech risk management system (Liu, 2024).

1.3 Research Content and Research Methods

This paper consists of five parts. Part one discusses the background and significance of the research, describing both the challenges faced by urban commercial banks and the opportunities they can seize. It is summarized that urban commercial banks should apprehend digital economy to adapt to the trends of the times. Part two elaborates on the concept, development and theoretical basis of digital economy. Part three and part four construct indicators and conduct empirical analysis and robustness tests. We will use descriptive statistics of operational data from 113 urban commercial banks from 2011 to 2021 and constructs a double-difference model, followed by analysis based on the results. Part five provides suggestions for mastering digital economy to enhance the profitability of urban commercial banks.

Three scientific methods are adopted in our research.

(1)Literature research, involving collecting, identifying and organizing literature, and then using literature review to form a scientific understanding of the facts.

(2)Data analysis, involving analyzing collected data, extracting useful information, and finally forming conclusions. Specifically in our research, it entails conducting detailed research and summarizing the operational data of 113 urban commercial banks from 2011 to 2021.

(3)Inductive analysis, involving analyzing specific facts or information to deduce common patterns or conclusions.

2.Concept, Development, and Theoretical Basis of Digital Economy

2.1 Concept

Digital economy, as an emerging economic form, is centered around digital technology and characterized by digitization, networking and intelligence. It injects new vitality into economic development by utilizing digital technology and information tools. Digital economy encompasses various aspects such as digital indus-

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tries, digital production, digital management and digital consumption. The development of digital economy demonstrates significant potential and value in enhancing productivity, driving innovation and entrepreneurship, optimizing resource allocation and improving quality of life. It accelerates the transformation and upgrading of traditional industries as well as fosters the emergence of numerous new industries, while injecting continuous dynamism into economic growth. Furthermore, digital economy provides people with more convenient and efficient life services, enhancing their quality of life.

In the banking sector, the concept of digital economy refers to banks mobilizing digital technology and Internet technology for business innovation and transformation, aiming to achieve a development model characterized by digitization, intelligence and online operation. The application of digital economy in the banking industry includes but goes beyond online banking services, mobile payments, digital currency, blockchain technology and artificial intelligence. Through the development of digital economy, banks can improve service efficiency, reduce costs, expand markets and enhance customer experience. In the future, digital technology may facilitate more robust and sustainable global economic development.

2.2 Development of Digital Economy

With the rapid development of information technology, digital technology has permeated various industries and fields, becoming the core engine driving economic growth and innovation. As digital technology advances rapidly, more and more banks have realized the urgency and importance of digital transformation. They actively embrace cutting-edge technologies such as cloud computing, big data and artificial intelligence, integrating them into production and operations to enhance productivity, optimize service processes and provide customers with more efficient products and higher-quality services. E-commerce has become an integral part of digital economy, with an increasing number of consumers opting for online shopping, which drives rapid growth in online retail. Meanwhile, the fintech industry plays a crucial role in digital economy, providing more convenient and efficient financial services by means of innovative technology. With widespread application of data, data security and privacy protection have become increasingly important, leading governments and enterprises to strengthen relevant laws, regulations and technical measures.

The actual development of digital economy in the banking industry can be described as flourishing. With the advancement of technology and the popularity of Internet, the banking industry is actively engaged in the wave of transformation and upgradation, accelerating the pace of digital transformation to meet the development needs of digital economy era. Firstly, with the rapid development of digital technology, the banking industry breaks free from traditional models and continually explores new business forms and service models. Banks can leverage new technologies such as artificial intelligence, big data and blockchain to improve service quality, optimize customer experience and introduce more competitive financial products. Secondly, digital economy brings more development opportunities for the banking industry. With the rise of new formats such as mobile payments and e-commerce, banks can expand into new business areas through cooperation with Internet companies, achieving diversified development. Finally, digital economy poses more challenges to the banking industry. With the rise of fintech companies, traditional banks face issues such as intensified competition and declining market share, necessitating more transformation and upgradation to enhance core competitiveness.

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In summary, digital economy brings new opportunities and challenges to the banking industry. As significant participants in the financial market, banks are suggested to innovate, closely follow market trends and continuously improve service levels to ensure a solid foothold in intense competition.

2.3 Theoretical Basis

Firstly, Information Economics Theory. This theory posits that information plays a pivotal role in market economies, by profoundly and extensively influencing them. According to Information Economics Theory, information is considered a valuable resource that profoundly affects market operations and efficiency. This theory encompasses several important aspects, such as the theory of information asymmetry, which suggests that differing information between buyers and sellers can lead to market asymmetry directly impacting market efficiency, fairness and the effectiveness of resource allocation. Information search theory studies the costs and benefits incurred by individuals in obtaining information and the impact of information acquisition on the market. Information cost theory focuses on the costs of information acquisition and transmission and their impact on market economies. In summary, Information Economics Theory posits that information plays a significant role in market economies, with profound implications for market operations and efficiency. Therefore, understanding Information Economics Theory is essential for understanding market operations and improving market mechanisms.

Secondly, Data-Driven Economy Theory. This theory advocates guiding economic activities and decision-making by collecting and analyzing vast amounts of data. In this theory, data is considered an essential resource that can help businesses, governments and individuals better understand market demands, optimize resource allocation, improve efficiency and create more value. The Data-Driven Economy Theory believes that with the development of technology and the continuous growth of data, we can utilize the powerful capabilities of data analysis and mining to delve into complex data sets as well as uncover hidden patterns and trends. Through data-driven methods, we can adapt to market changes more rapidly, improve productivity, reduce costs and achieve more sustainable economic growth. The core idea of the Data-Driven Economy Theory is to utilize data to guide economic activities, realizing more efficient and intelligent economic operations.

Thirdly, Internet Economy Theory. This theory refers to a series of theoretical viewpoints and analytical methods that promote economic development and innovation through Internet platforms and digital technology. These theories mainly include network effects, platform economy, sharing economy, digital economy, data economy, etc., aiming to explain and predict the impact of the Internet on economic structure, industrial development and business models, as well as how to utilize Internet technology to achieve economic growth and improve efficiency. Internet Economy Theory holds significant theoretical guidance and practical significance in today's digital age.

Fourthly, Digital Transformation Theory. This theory refers to the active adjustment of business models, processes and organizational structures by enterprises or organizations in the context of digital technology flourishing development, fully utilizing digital technology to achieve efficiency enhancement, value creation and innovation promotion. This theory recognizes the crucial role of digital technology in enterprise development and emphasizes the indispensable position of digital technology in enhancing enterprise competitiveness and promoting sustainable development. Digital Transformation Theory encompasses many aspects, such as

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data-driven decision-making, digital marketing, big data analysis and artificial intelligence application. It also emphasizes the importance of organizational culture and talent cultivation in digital transformation. Introducing and practicing digital transformation concepts promote enterprises' attention to and application of digital technology, enabling enterprises to respond more effectively to various challenges and opportunities in the digital age, thereby enhancing competitiveness and innovation capabilities.

3.Research Design

3.1 Data Source

This study analyzes panel data of urban commercial banks from 2011 to 2021. Financial performance data of banks and the primary cities of operation are sourced from publicly disclosed data of respective urban commercial banks, manually collected and processed. Data on the level of digital economic development in cities are sourced from the China Statistical Yearbook and China City Statistical Yearbook, aggregated using entropy weighting method. Control variable data primarily come from the Guotai Junan and Wind databases. Ultimately, the dataset used for empirical analysis comprises 885 samples from 113 urban commercial banks.

3.2 Index Construction

Dependent Variables. This study includes three dependent variables: Return on Assets (*ROA*), Return on Equity (*ROE*), and Non-performing Loan Ratio (*NPLR*). *ROA* is the ratio of net income and average total assets, *ROE* is the ratio of net income and average shareholders' equity, and *NPLR* is the ratio of non-performing loans and total outstanding loans.

Independent Variable. The independent variable in this study is the level of digital economy in cities (Digit). It's constructed based on indicators of digital infrastructure, digital industry development, and digital inclusive finance, using the entropy weighting method.

Control Variables. Control variables in this study include total bank assets, total bank liabilities, net capital, per capita regional GDP, the proportion of secondary industry value added to GDP, the proportion of tertiary industry value added to GDP and urban population.

The definitions and descriptive statistics of each variable are presented in Table 1.

Table 1 Variable definitions and descriptive statistics

Variable Name	Variable Definition	Obs	Mean	S.D.	Min	Max
ROA	Return on assets	885	0.936	0.465	-0.227	2.388
ROE	Return on equity	885	13.455	7.054	-1.705	36.754
NPLR	Non-performing loan ratio	792	1.412	0.751	0.010	4.860
Digit	Level of digital economy	885	10.858	10.079	1.502	66.462
lnAssets	Logarithm of total bank assets	885	16.363	1.111	12.127	19.539
lnLiabilities	Logarithm of total bank liabilities	885	16.284	1.122	11.583	19.437
lnCapital	Logarithm of bank net capital	885	23.105	1.090	20.218	25.873
GDP	Per capita regional GDP	885	7.646	3.927	1.639	18.398
Industry	Proportion of secondary industry value added to GDP	885	44.954	9.856	16.160	89.34
Service	Proportion of tertiary industry value added to GDP	885	48.164	11.318	24.070	79.000
Population	Logarithm of urban total population	885	6.260	0.725	3.784	8.115

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3.3 Model Construction

To examine the impact of digital economy on the profitability and risk level of urban commercial banks, this study constructs a two-way fixed-effects model as follows:

$$ROA_{it} = \beta_0 + \beta_1 Digit_{it} + \Sigma\beta_k Controls_{it} + \eta_i + \gamma_{t+} \varepsilon_{it}$$
$$ROE_{it} = \beta_0 + \beta_1 Digit_{it} + \Sigma\beta_k Controls_{it} + \eta_i + \gamma_{t+} \varepsilon_{it}$$
$$NPLR_{it} = \beta_0 + \beta_1 Digit_{it} + \Sigma\beta_k Controls_{it} + \eta_i + \gamma_{t+} \varepsilon_{it}$$

Where ROA_{it}, ROE_{it}, and $NPLR_{it}$ are the three dependent variables representing the total asset return rate, net asset return rate, and non-performing loan ratio of urban commercial banks, respectively. $Digit_{it}$ denotes the core independent variable, i.e., the level of digital economic development in various cities. $Controls_{it}$ represent a series of control variables. η_i and γ_t represent bank and year fixed effects, respectively, and ε_{it} denotes the error term.

4.Empirical Results

4.1 Baseline Regression Results

Table 2 presents the regression results of how digital economy influences the profitability of urban commercial banks. Columns (1)-(2) show the results without fixed effects, while columns (3)-(4) include fixed effects. The results indicate that for every 1 percentage point increase in the level of digital economic development, the total asset return rate increases by 1.7 percentage points, and the net asset return rate increases by 13 percentage points, both significant at the 5% and 1% levels, respectively. This suggests that the development of digital economy in cities enhances the internal management level of urban commercial banks, reduces resource allocation costs, logistics costs, search costs and verification costs, improves the efficiency of fund utilization, lowers transaction costs and effectively promotes the total asset return rate and net asset return rate of commercial banks, thereby enhancing profitability.

Table 2 Baseline results of impact of digital economy on profitability of urban commercial banks

Variables	(1) *ROA*	(2) *ROE*	(3) *ROA*	(4) *ROE*
Digit	0.008***	0.095***	0.017***	0.130**
	(0.003)	(0.037)	(0.004)	(0.056)
lnAssets	0.324	17.256	-1.343	-19.156
	(1.318)	(11.674)	(1.448)	(14.379)
lnLiabilities	-0.178	-5.409	1.080	22.827*
	(1.205)	(10.276)	(1.336)	(12.987)
lnCapital	-0.134	-11.509***	0.439***	-1.003
	(0.125)	(1.578)	(0.161)	(1.914)
GDP	-0.034***	-0.454***	0.031***	0.400***
	(0.007)	(0.095)	(0.010)	(0.150)
Industry	0.024***	0.284***	-0.015*	-0.342***
	(0.004)	(0.051)	(0.009)	(0.120)
Service	0.001	-0.023	-0.026***	-0.517***
	(0.003)	(0.050)	(0.009)	(0.128)
Population	-0.047	0.029	1.007***	11.953***
	(0.031)	(0.415)	(0.217)	(3.102)
Constant	0.990	75.649***	-9.647***	-60.622**
	(0.842)	(12.095)	(2.364)	(29.378)

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Bank fixed effects (η_i)	No	No	Yes	Yes
Year fixed effects (γ_t)	No	No	Yes	Yes
Within R^2	0.228	0.328	0.149	0.182
N	885	885	885	885

Note: ***, **, * represents significance level at 1%, 5%, and 10%, respectively. Standard errors are listed in bracket.

Table 3 displays the regression results of how digital economy affects the operational risk of urban commercial banks. Column (1) shows the results without fixed effects, while column (2) includes fixed effects. The results indicate that for every 1 percentage point increase in the level of digital economic development, the non-performing loan ratio decreases by 1.8 percentage points, significant at the 5% and 1% levels, respectively. This suggests that, on the one hand, digital economy can strengthen the ability of urban commercial banks to identify users, reduce the level of information asymmetry and ensure that potential borrowers have sufficient repayment capacity. On the other hand, digital economy can help urban commercial banks monitor the operating conditions, financial status, and repayment status of borrowers and take corresponding risk control measures, such as adjusting loan conditions and reclaiming collateral. Therefore, the development of digital economy in cities can effectively reduce the non-performing loan ratio of commercial banks.

Table 3 Baseline results of impact of digital economy on risks of urban commercial banks

Variables	(1) *NPLR*	(2) *NPLR*
Digit	-0.044***	-0.018**
	(0.005)	(0.009)
lnAssets	-1.540	3.820*
	(3.077)	(2.310)
lnLiabilities	0.793	-3.539*
	(2.845)	(2.096)
lnCapital	0.747***	-0.619**
	(0.264)	(0.262)
GDP	0.044***	-0.029
	(0.011)	(0.019)
Industry	-0.034***	-0.001
	(0.006)	(0.018)
Service	0.004	0.042**
	(0.006)	(0.018)
Population	0.122**	-0.863**
	(0.049)	(0.375)
Constant	-2.815*	14.698***
	(1.608)	(3.573)
Bank fixed effects (η_i)	No	Yes
Year fixed effects (γ_t)	No	Yes
Within R^2	0.196	0.126
N	792	790

Note: ***, **, * represents significance level at 1%, 5%, and 10%, respectively. Standard errors are listed in bracket.

4.2 Robustness Checks

This study employs a lagged model to conduct robustness checks. Specifically, the level of digital economy in cities is lagged by one period, and the regression is re-estimated, thus temporally avoiding reverse causality. As shown in Table 4, the results indicate that the level of digital economy still significantly improves the total asset return rate and net asset return rate of banks while reducing the non-performing loan ratio, which

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justifies the robustness of the previous results. Furthermore, the coefficients of the impact of digital economy on the total asset return rate, net asset return rate and non-performing loan ratio are larger than the baseline regression results, indicating that digital economy takes some time to exert its effects.

Table 4 Analysis of lagged models

Variables	(1) *ROE*	(2) *ROA*	(3) *NPLR*
Digit	0.028***	0.243**	-0.026*
	(0.008)	(0.107)	(0.015)
Constant	-10.151***	-46.925	3.682
	(3.371)	(43.372)	(4.767)
Control Variables	Yes	Yes	Yes
Bank fixed effects (η_i)	Yes	Yes	Yes
Year fixed effects (γ_t)	Yes	Yes	Yes
Within R^2	0.153	0.156	0.079
N	554	554	501

Note: ***, **, * represents significance level at 1%, 5%, and 10%, respectively. Standard errors are listed in bracket.

4.3 Extension Analysis

This study employs quantile regression to identify the impact of digital economy on the profitability and operational risk of urban commercial banks.

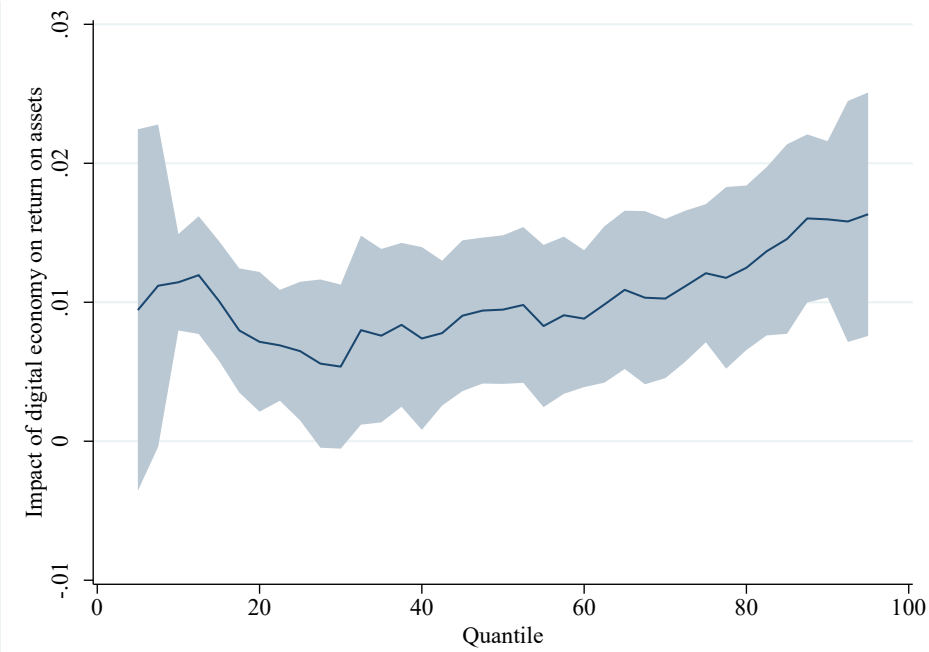


Figure 1 Impact of digital economy on return on assets (ROA)

As depicted in Figure 1, as the level of net asset return rate increases, the coefficient of digital economy on the net asset return rate remains stable overall. This can be explained by the fact that the net asset return rate reflects the profitability of capital invested by bank owners, who may not necessarily allocate a large number of funds to the development of digital economy. Therefore, the promotional effect of digital economy on the net asset return rate is less pronounced in commercial banks with better profitability.

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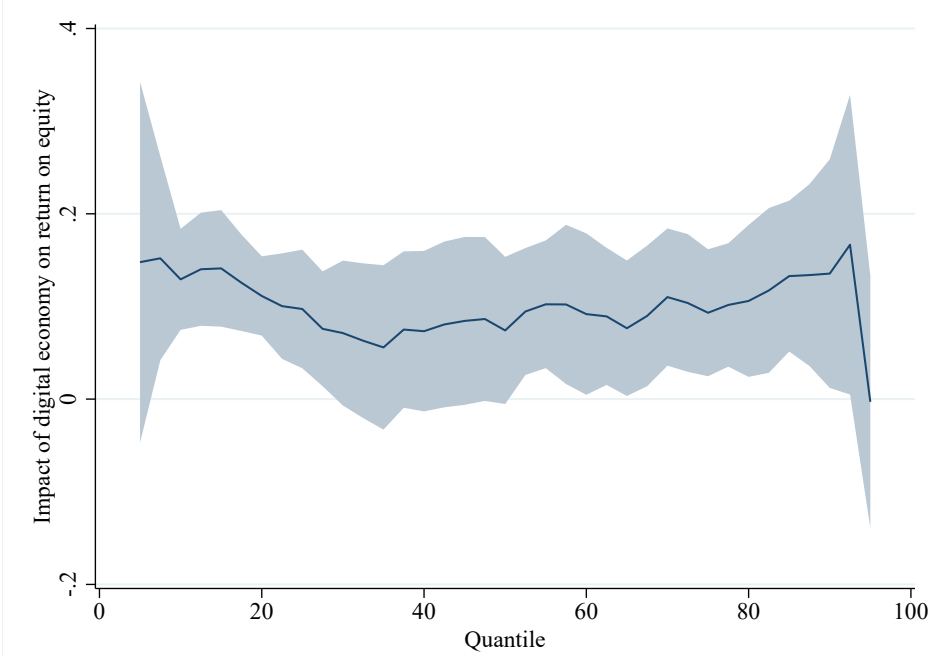


Figure 2 Impact of digital economy on return on equity (ROE)

As depicted in Figure 2, as the level of net asset return rate increases, the coefficient of the digital economy on the net asset return rate remains stable overall. This can be explained by the fact that the net asset return rate reflects the profitability of capital invested by bank owners, who may not necessarily allocate a large amount of funds to the development of the digital economy. Therefore, the promotional effect of the digital economy on the net asset return rate is less pronounced in commercial banks with better profitability.

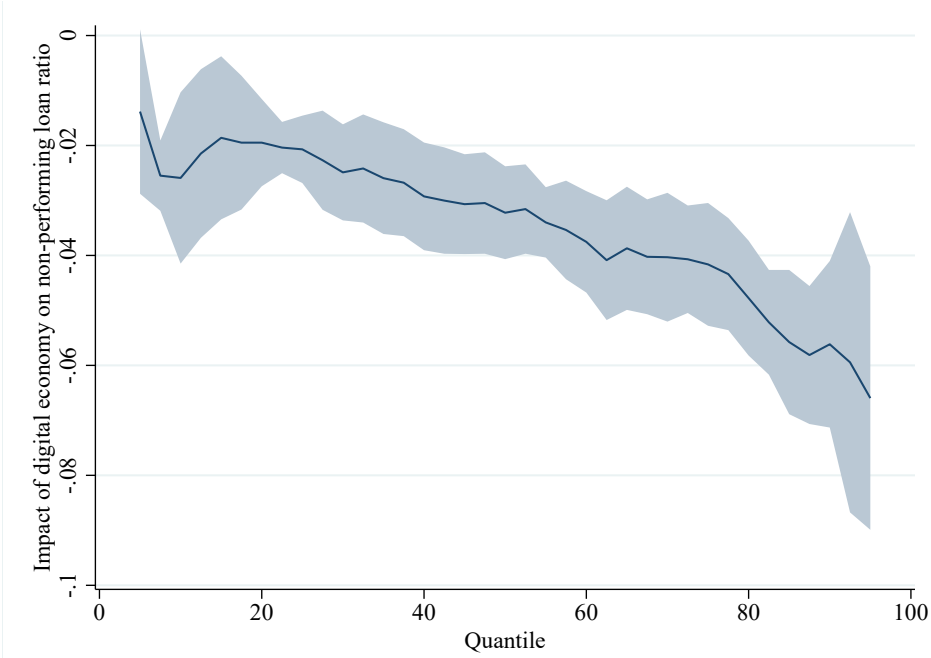


Figure 3 Impact of digital economy on non-performing loan ratio (NPLR)

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As shown in Figure 3, as the level of non-performing loan ratio increases, the coefficient of digital economy on the non-performing loan ratio continuously decreases. This can be explained by the fact that in the context of vigorous development of digital economy in cities, banks with better profitability usually have richer resources and technological strength to promote digital transformation, thereby optimizing the credit process, enhancing risk management capabilities, establishing better risk management systems, reducing the occurrence of non-performing loans and consequently lowering the non-performing loan ratio. Therefore, the reduction effect of digital economy on the non-performing loan ratio is more pronounced in commercial banks with better profitability.

The previous analysis indicates that the development of digital economy not only contributes to the improvement of profitability of urban commercial banks but also effectively reduces their operational risks. However, it is worth noting that the impact of digital economy on urban commercial banks is not immediate but rather hysteretic. This implies that although digital economy has begun to play a positive role, its comprehensive and profound impact may take some time to fully manifest. Therefore, while urban commercial banks enjoy the dividends brought by digital economy, they still need to wait patiently and continuously observe its long-term effects to better respond to potential risks and opportunities. Hence, it is necessary to continue promoting the development of digital economy while encouraging urban commercial banks to leverage “digital intelligence” to create innovative digital banks.

5.Conclusion and Policy Recommendations

5.1 Expand Business

Nowadays, the main businesses driving the improvement of urban commercial banks profitability have mostly been fully developed, making it difficult to increase revenue significantly. However, with the development of digital economy, urban commercial banks can rely on digital technology to develop new businesses and diversify their operations. Firstly, in addition to traditional personal and corporate loans, banks can expand into more types of loans, such as housing loans, car loans and education ones, to meet the needs of different customer groups. Secondly, banks can increase online services, including one-stop wealth management services, investment consulting, insurance planning and retirement planning, to better attract high-net-worth customers and increase fee and commission income. At the same time, banks can introduce different types of credit card products, such as high-end credit cards for high-income groups, student credit cards for young people and co-branded credit cards issued in cooperation with merchants, to attract more customers and increase transaction volume. Furthermore, urban commercial banks can strengthen communication with international banks through technological means and expand international business, such as cross-border payments, foreign exchange transactions and international trade financing. These payment solutions can meet diverse customer payment needs, provide a more convenient payment experience, and attract more customers to use the bank’s payment services. Finally, by increasing international transaction volume, banks can gain more profit opportunities in foreign markets. Banks can actively seek in-depth cooperation with financial technology companies to jointly develop and launch a series of financial products and services that integrate advanced financial technology. For example, by using blockchain technology, both parties can jointly create efficient and secure cross-border remittance services so as to provide customers with more convenient and

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low-cost international fund transfer experience. Meanwhile, with the help of artificial intelligence technology, both parties can introduce intelligent investment advisory services to provide customers with personalized investment plans, helping them achieve reasonable asset allocation and value appreciation. These innovative products can attract technology-sensitive customers and increase the bank's sources of income.

5.2 Embrace Digital Economy under Low Costs

In the past, due to urban commercial banks' small scale or distribution in various cities, they may have had difficulty concentrating on personnel training or information exchange, which may have resulted in inefficient economic information processing leading to higher costs. Firstly, urban commercial banks can use digital technology to optimize organizational structures, eliminate redundant departments and levels and improve decision-making efficiency. Secondly, digital technology such as online guidance can increase employees' skills and professional knowledge. Then, urban commercial banks should promote automation and digitization technologies, such as Robotic Process Automation (RPA), Artificial Intelligence (AI), and Machine Learning (ML), to simplify and automate daily operations, reduce manual operations, lower error rates, improve work efficiency, and reduce labor costs. Finally, urban commercial banks should conduct strict cost and budget management, identify, evaluate and control resource utilization through regular budget reviews and adjustments to ensure rational resource allocation.

5.3 Improve Asset Quality

Firstly, banks can use big data and artificial intelligence technology to establish sound risk management systems. Secondly, user risk assessment models can be established to quantitatively assess the credit risks of borrowers. These models can predict the default probability of borrowers based on historical data and market conditions, helping banks make more accurate credit decisions. Then, credit review and due diligence for staff should be strengthened to ensure the compliance and security of loan issuance. Finally, for post-loan management, banks should track and monitor loans that have been issued regularly, promptly identify and address potential risk issues, such as adjusting loan conditions and reclaiming collateral.

5.4 Enhance Risk Management

Risk classification system is an important cornerstone for preventing and managing credit risks. Currently, China has comprehensively upgraded the risk classification system. This means that whether it is loans, bonds, or other forms , credit business will all be included in a unified risk classification system. To ensure the smooth implementation of the risk classification system, China requires commercial banks to guarantee the professionalism and independence of risk classification work from an organizational level. Firstly, commercial banks can reduce risk exposure, protect assets, and improve profitability by strengthening risk management. Secondly, by using financial technology means, such as big data technology, commercial banks can improve data quality and ensure that risk management decisions are based on accurate, effective and timely data. Finally, vigorously promote the research and development of financial technology achievements and apply them to daily risk management work, involving the use of technology means, intelligent warning systems, customer knowledge maps and cloud computing, to ensure the continuity and stability of business in case of sudden events.

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