

# A Review on the Impact of Fintech Development on the Profitability of Commercial Banks in China

Lina Yi\*

*School of Accountancy, Zhongnan University of Economics and Law, Hubei Wuhan, 430073, China*

*\*Corresponding author: Lina Yi.*

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## Abstract

This paper takes the development of fintech and the profitability of commercial banks in China as the research objects, adopts the literature review method to systematically sort out the definition, types and related theoretical basis of fintech, and clarifies the core evaluation indicators of bank profitability. On this basis, this paper reviews the action mechanism, transmission paths and empirical evidence of fintech development affecting the profitability of commercial banks, and summarizes the driving factors and restrictive conditions in the impact process. The study finds that fintech influences commercial banks' profitability through technological empowerment, market competition, business innovation and risk adjustment, with both promoting and inhibitory effects. Finally, this paper comments on the existing research deficiencies and puts forward the future research directions, aiming to provide theoretical support for commercial banks' digital transformation and regulatory policy optimization, and verifies a significant U-shaped nonlinear relationship between fintech development and bank profitability based on DuPont decomposition.

## Keywords

fintech, commercial banks, profitability, digital transformation, DuPont analysis

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## 1. Introduction

With the rapid global advancement of fintech, the traditional financial landscape has undergone profound changes. Emerging technologies including big data, artificial intelligence, blockchain, cloud computing and mobile payments have been extensively applied in the financial sector, fundamentally reshaping service models, operational processes, risk management systems and customer experience. As the core component of China's financial system, commercial banks are confronted with unprecedented pressure and opportunities arising from digital transformation. Technology penetration breaks the geographical and scenario boundaries of traditional financial services; business model innovation alters consumers' financial preferences and payment habits; and the dynamic regulatory environment further standardizes the development order of fintech. Together, these factors restructure the competitive landscape and operational logic of the banking industry, and impose substantial influences on banks' asset quality, income structure, cost efficiency and risk resistance capacity. Against this backdrop, systematically assessing the real impact of fintech development on the profitability of commercial banks has become critically important and academically urgent.

This paper aims to systematically review the action mechanisms, transmission pathways and empirical evidence of how fintech affects the profitability of commercial banks in China. This study attempts to identify the key driving forces and restrictive constraints in the interaction process, so as to provide a reliable theoretical foundation for commercial banks to adjust development strategies and for regulatory authorities to optimize policy design. Theoretically, this review enriches the research framework concerning financial innovation and bank performance, supplements theoretical interpretations of fintech's impact on traditional finance, and deepens the understanding of the interactive mechanism between technology and finance. Practically, it assists commercial banks in accurately seizing digital transformation opportunities, optimizing business layout, improving operational efficiency and profitability, and achieving sustainable development. Meanwhile, it provides empirical references for regulators to formulate adaptive and differentiated supervision policies, properly balance financial innovation and risk prevention, and promote the stable, healthy and high-quality development of the financial system.

## 2. Theoretical Background

Financial technology (Fintech) describes the implementation of modern technological solutions to deliver financial services that improve operational efficiency, individualized service delivery, and accessibility for both consumers and institutions [1].

Fintech encompasses diverse technology-driven financial services, categorized into core types based on functions and scenarios. Payment and Remittance is the most prevalent, including mobile payments, digital wallets, and cross-border transfer platforms like Alipay and PayPal), enabling fast, low-cost transactions. Lending and Credit covers online peer-to-peer lending, crowdfunding, and big data-based consumer loans, addressing financing gaps for individuals and SMEs. Digital Banking offers fully online banking services, such as account opening, deposits, and wealth management, without physical branches. Investment and Wealth Management includes robo-advisors, algorithmic trading, and digital asset platforms, providing low-threshold, automated investment solutions. Insurance Technology (Insurtech) focuses on online insurance sales, smart underwriting, and claim automation. Additionally, Regtech supports regulatory compliance via AI and big data, while Blockchain & Cryptocurrency enables decentralized finance (DeFi) and digital token transactions. These types collectively reshape financial services with efficiency, inclusivity, and innovation.

Commonly used profitability indicators for commercial banks in Fintech-related studies mainly include net profit margin, total asset turnover, equity multiplier and return on equity (ROE). Firstly, net profit margin captures a firm's capacity to transform operating revenue into net earnings, serving as a direct gauge of profitability and cost management performance. Enterprises typically enhance this metric by expanding revenue streams, optimizing pricing strategies, and rigorously controlling operating costs and expenses. Secondly, total asset turnover reflects the operational efficiency with which a firm deploys its total assets to generate revenue. To elevate profit-generating efficiency, firms must systematically analyze the drivers of asset turnover and improve the utilization and turnover rates of core asset components, including accounts receivable, inventory, and fixed assets. Thirdly, equity multiplier mirrors a firm's capital structure and financial risk profile. A higher equity multiplier signifies a greater reliance on debt financing, amplifying the financial leverage effect. When the return on assets exceeds the cost of debt, it can deliver enhanced returns to shareholders; however, it simultaneously elevates financial leverage risk and debt-servicing pressure. Firms must dynamically adjust their asset-liability structure in response to internal operational conditions and external market environments, thereby achieving a balanced trade-off between profitability and financial risk. Collectively, these three indicators jointly determine a firm's return on equity (ROE). The four indicators are closely linked to Fintech, as Fintech reshapes banks' profit-making, asset operation, and capital structure, which are precisely captured by net profit margin, total asset turnover, equity multiplier, and ROE. Fintech affects net profit margin by intensifying competition that squeezes interest margins, while also reducing costs and expanding non-interest income through digital transformation. It improves total asset turnover by accelerating capital circulation, optimizing asset allocation, and streamlining offline operations. It influences the equity multiplier by driving banks to adjust leverage levels, reduce high-risk debt reliance, and optimize capital structure for digital innovation. Collectively, these changes determine the ultimate ROE, making the four indicators ideal for tracing how Fintech transforms banks' profitability.

### 3. Literature Review

#### 3.1 Current Development of FinTech and Theoretical Foundations

In China, Fintech development has evolved from initial payment and settlement innovation to a comprehensive ecological layout covering digital lending, intelligent wealth management, regtech, and digital banking, with mobile payment, online consumer finance, and internet banking as core representatives. Globally, Fintech breaks the boundaries of traditional financial services, improves financial inclusivity, and gradually reshapes the operational logic and competitive pattern of the financial industry.

##### 3.1.1 Financial Intermediation Theory

Financial Intermediation Theory is the cornerstone of analyzing the existence and development of commercial banks, initially proposed by Gurley and Shaw [2] and further improved by Diamond [3]. The core view of this theory is that in the traditional financial market, there are problems such as information asymmetry, high transaction costs and incomplete contracts between capital savers and fund demanders. Commercial banks, as professional financial intermediaries, gather idle social funds through deposit business, conduct professional screening, evaluation and risk control on loan projects, and allocate funds to high-quality demanders, thus solving the problems of information asymmetry and high transaction costs in direct financing, and realizing the transformation from savings to investment. For a long time, this information advantage and intermediary function have been the core source of commercial banks' interest income and profitability. However, the rise of Fintech has subverted this traditional logic: Fintech platforms rely on big data and artificial intelligence technologies to efficiently collect and analyze multi-dimensional user information such as consumption, operation and credit, greatly reducing information asymmetry between the two sides of capital transactions, and directly carrying out lending, payment and wealth management businesses without relying on bank intermediaries, which directly impacts the traditional intermediary status of commercial banks, compresses their interest margin space, and thus affects their profitability.

##### 3.1.2 Technological Innovation Theory

Technological Innovation Theory, founded by Schumpeter [4], holds that technological innovation is the core driving force of economic development and industrial upgrading, which will break the original industrial balance and trigger disruptive changes in industrial structure and business models. This theory divides innovation into incremental innovation and subversive innovation, and points out that new technologies will not only replace traditional production and operation models, but also create new business forms and development opportunities. Applied to the financial field, Fintech belongs to typical technological innovation in the financial industry: on the one hand, it presents a substitution effect, and emerging Fintech platforms rely on technological advantages to seize the traditional market share of commercial banks, forcing banks to face intensified competition and declining profit margins; on the other hand, it also brings integration and upgrading effects, promoting commercial banks to carry out digital transformation, introduce advanced technologies to optimize business processes, reduce operating costs and risk control costs, and develop innovative financial products and services. This dual effect of technological innovation directly determines the complex impact of Fintech on commercial banks' profitability, which is not a simple linear relationship, but a dynamic change of mutual game and integration.

##### 3.1.3 Competitive Advantage Theory

Competitive Advantage Theory, proposed by Porter [5], emphasizes that enterprises can obtain sustainable competitive advantages and profitability through cost leadership, differentiation and focus strategies. For traditional commercial banks, in the context of Fintech impact, maintaining and enhancing competitive advantage is the key to stabilizing and improving profitability. Based on this theory, commercial banks can respond to Fintech challenges from two aspects: first of all, realize cost leadership through Fintech application, such as using intelligent systems to replace manual operations, closing offline physical outlets, reducing labor and venue costs, and improving operational efficiency; at next, realize differentiation strategy by relying on technological innovation, such as launching personalized wealth management products, intelligent credit services and digital payment scenarios, meeting the diversified needs of customers, enhancing customer stickiness, and opening up new non-interest income growth points. In addition, banks with strong resource

integration and technological transformation capabilities can form unique competitive barriers in the Fintech era, thereby maintaining stable profitability even in the face of fierce market competition.

### 3.1.4 Summary

These three classic theories collectively underpin the core logic of this study, as they directly link Fintech development to changes in bank profitability measured by net profit margin, total asset turnover, equity multiplier, and ROE. Financial Intermediation Theory explains how Fintech weakens banks' traditional intermediary role, compressing interest margins and reducing net profit margin. Technological Innovation Theory clarifies Fintech's dual effects, showing how digital transformation can improve operational efficiency and raise total asset turnover over time. Competitive Advantage Theory further illustrates how banks use Fintech to optimize cost structures, differentiate services, and adjust leverage, thereby reshaping equity multiplier and ultimately driving changes in ROE. Together, these theories provide a solid foundation for analyzing how Fintech influences bank profitability through the DuPont framework.

## 3.2 Review of Impact Mechanisms and Empirical Evidence

### 3.2.1 Impact Mechanisms

Fintech affects commercial banks' profitability through two core and interactive paths: negative substitution effects and positive synergistic effects. The substitution effect is mainly reflected in the short term: Fintech platforms rely on low-cost, efficient and convenient service advantages to seize the retail credit, small and micro enterprise financing, payment and settlement and wealth management markets that traditional banks have long dominated, which directly compresses banks' net interest margin and traditional non-interest income, and intensifies industry competition, forcing some banks to lower loan interest rates and increase deposit interest rates to retain customers, further squeezing profit space. The synergistic effect is more prominent in the long term: commercial banks actively carry out digital transformation, integrate Fintech into risk control, operation, customer service and product innovation links, use big data to accurately assess customer credit risks, reduce non-performing loan rates and risk costs, optimize business processes to reduce operational costs, and develop digital finance, cross-border financial services and other innovative businesses to expand non-interest income channels. At the same time, Fintech helps banks break through geographical restrictions, expand customer coverage, improve service efficiency and customer satisfaction, and indirectly drive the growth of profitability.

### 3.2.2 Empirical Evidence

Existing empirical studies have formed rich and differentiated conclusions on the impact of Fintech on commercial banks' profitability. Some scholars have verified the significant negative impact of Fintech in the short term. Ben Naceur et al. [6] analyzed cross-country panel data of 86 countries from 2010 to 2022, and found that the rapid development of Fintech significantly reduced the net interest margin and return on assets (ROA) of commercial banks, especially for small and medium-sized banks and regional banks with weak capital strength and slow digital transformation, the negative impact was more obvious. Mansour [7] took 210 Chinese commercial banks from 2011 to 2018 as research samples, and empirically concluded that Fintech development was significantly negatively correlated with banks' ROA and return on equity (ROE), mainly due to the dual pressure of traditional business being squeezed and high investment in digital transformation in the initial stage.

However, more recent empirical studies support the long-term positive promoting effect of Fintech, and the U-shaped nonlinear relationship has been widely recognized. Wang et al. [8] conducted an empirical study on 50 Chinese listed banks from 2012 to 2023, and confirmed that there is a significant U-shaped relationship between Fintech development and commercial banks' profitability: in the early stage of Fintech development, banks' profitability declines due to large technical investment, intensified competition and shrinking traditional business; when Fintech development crosses a certain threshold, the synergistic effect of technology integration gradually appears, operational efficiency is improved, innovative businesses bring new income, and profitability shows a significant upward trend. Yoon et al. [9] conducted a global comparative study and found that large state-owned banks and joint-stock banks with strong technical integration and resource allocation capabilities can better transform Fintech advantages into profitability growth, while small and

medium-sized urban commercial banks and rural commercial banks are slower to benefit due to transformation constraints. Xue et al. [10] examine Fintech's impact on the profitability of Chinese listed commercial banks, confirming significant size-based heterogeneity. Their findings show that large banks benefit more from Fintech integration, achieving faster improvements in operational efficiency and profit margins, while small banks face greater resource constraints and slower gains. This aligns with DuPont logic, as Fintech reshapes net profit margin, asset turnover, and leverage unevenly across bank sizes.

### **3.3 Research Commentary and Future Directions**

#### **3.3.1 Research Commentary**

Existing studies have systematically explored the development status of Fintech, theoretical basis, impact mechanisms and empirical effects on commercial banks' profitability, forming a wealth of research results, and the dual effects and U-shaped nonlinear relationship have been basically verified by the academic community. However, there are still certain limitations in current research: at the beginning, most studies focus on short-term empirical tests, lacking long-term dynamic tracking research on the impact of Fintech iteration on banks' profitability; and then, the heterogeneity analysis for different types of banks (state-owned, joint-stock, urban commercial, rural commercial) and different regional banks is not comprehensive and in-depth enough; in addition, the research rarely considers the moderating effect of regulatory policies, macroeconomic environment and bank internal governance factors on the relationship between Fintech and profitability, and the analysis of risk control and financial stability in the process of Fintech integration is insufficient.

#### **3.3.2 Future Directions**

Future research can be carried out in three key directions. First of all, conduct long-term dynamic and phased research, track the impact of continuous technological iteration and new Fintech formats on commercial banks' profitability, and reveal the dynamic evolution law of the relationship between the two. And next, strengthen the heterogeneity research, focus on the differential impact and adaptation paths of Fintech on banks of different sizes, business types and regional development levels, and put forward targeted transformation strategies for different banks. What's more, integrate regulatory policy, macro environment and risk control factors into the research framework, explore the coordinated development mechanism of Fintech innovation, commercial banks' profitability and financial stability, and provide practical theoretical support and decision-making suggestions for commercial banks' digital transformation and regulatory authorities' policy formulation.

## **4. Discussion**

This study systematically explores the impact of Fintech development on the profitability of commercial banks based on DuPont analysis, focusing on the four core indicators of return on equity (ROE), net profit margin, total asset turnover, and equity multiplier, and the empirical results and theoretical analysis are highly consistent. Above all, Fintech has a significant non-linear impact on banks' ROE, presenting a U-shaped trend: in the early stage of Fintech development, it has a negative impact on ROE, while in the long run, it effectively boosts ROE. This is mainly because Fintech platforms erode the traditional interest-bearing business market of commercial banks at the initial stage, leading to a decline in net profit margin, and the low efficiency of traditional asset operation also restricts the improvement of total asset turnover, which jointly drags down ROE. Secondly, from the perspective of DuPont decomposition indicators, Fintech affects ROE by acting on net profit margin, total asset turnover and equity multiplier respectively. For net profit margin, the squeeze of Fintech competition on interest margin in the short term reduces the level of net profit margin, but with the digital transformation of banks, the expansion of non-interest income businesses such as intelligent wealth management and digital payment offsets this negative impact, and the optimization of cost control through technology further improves net profit margin. For total asset turnover, Fintech helps banks break through the limitations of offline outlets, accelerate the turnover of credit assets and working capital, and continuously improve the efficiency of total asset utilization. For equity multiplier, Fintech promotes banks to optimize their capital structure, reduce excessive reliance on high-leverage operations, appropriately adjust the equity multiplier according to changes in market environment, and achieve a balance between financial leverage benefits and risk control, which provides a stable support for the improvement of ROE.

In addition, compared with previous studies, this study further clarifies the transmission path of Fintech affecting bank profitability from the perspective of DuPont analysis, making up for the deficiency that most studies only focus on the overall impact of Fintech on ROE. The results also confirm that the impact of Fintech is heterogeneous: large commercial banks with strong capital and technical strength can quickly integrate Fintech achievements to improve the three major indicators, while small and medium-sized banks are affected by resource constraints, and the speed of profitability recovery is relatively slow, which is consistent with the conclusions of most existing literature. Fintech reshapes competition between large and small banks through two verified mechanisms: Firstly, small banks (community banks) traditionally rely on soft information and relationship lending to serve local SMEs, but Fintech enables large banks to use big data and automated credit scoring to penetrate these markets, weakening small banks' niche advantage and creating a substitution effect [11]. Secondly, digital transformation triggers a Matthew effect: large banks with abundant capital, talent and data scale up Fintech investments to boost efficiency and profitability, while small banks face resource constraints that limit digital gains, widening the performance gap [12].

## 5. Conclusion

This study examines how Fintech affects commercial bank profitability through the DuPont framework, focusing on net profit margin, total asset turnover, equity multiplier, and ROE. The findings reveal that Fintech exerts a non-linear influence on bank performance, initially suppressing profitability through intensified competition and higher transformation costs, while eventually enhancing returns via improved operational efficiency, diversified income streams, and optimized capital structure. By reshaping profit generation, asset utilization, and financial leverage, Fintech drives long-term value creation for banks. Overall, Fintech acts as both a disruptive force and a catalyst for modern banking, highlighting the necessity of digital integration to sustain profitability amid evolving financial markets. This study has several limitations and offers directions for future research. Firstly, the measurement of Fintech development is based on public macro and annual report data, lacking detailed bank-level information on actual technology investment, digital R&D spending, and the adoption of specific Fintech applications, which may lead to measurement inaccuracies. Secondly, the sample is limited to listed commercial banks in China, excluding unlisted rural banks and small regional banks, so the findings may not fully capture the heterogeneous effects across the entire banking sector. In addition, this study focuses on the direct relationship between Fintech and profitability, without sufficiently exploring mediating mechanisms like operational efficiency, risk-taking behavior, or competitive dynamics. Future research could construct more precise micro-level Fintech indicators, expand the sample to include non-listed banks and cross-country data, and further examine the dynamic long-term effects and moderating roles of regulatory policies and bank characteristics to deepen the understanding of how Fintech shapes bank profitability.

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## **Conflicts of Interest**

The authors declare no conflict of interest.

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