The Heterogeneous Effects of Internet Finance on the Profits of Commercial Banks in China

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Abstract. Since 2012, the Internet finance (ITFIN), as a rising star in the financial industry, has impacted the traditional finance with its unique operating model and market transmission path. Our work explores the role of ITFIN on the profit structure and profitability of commercial banks from a new perspective of market structure. Based on the research on the mechanism of action, we construct an econometric model and conduct an empirical analysis: our panel data model contains the main indicators disclosed by 16 representative commercial banks from 2010 to 2018, including the total asset profit rate and the three major business development data (asset, liability, and intermediary business), and tests the specific impact of ITFIN on the profitability of commercial banks. Our work draws the following conclusions and implications: First, the development of ITFIN will promote the profitability of commercial banks, and it will promote the diversified development of commercial banks' profit structure. Therefore, in the development process, the commercial banks should pay attention to win-win cooperation and develop financial technology, while optimizing market structure and integrating financial resources to promote the optimization of the market economy system. Second, the impacts of ITFIN on the profitability of different types of commercial banks are heterogeneous. The effects on the profitability of state-owned are more significant, while the effects on the diversified development of the municipals are more favorable. Therefore, when developing, the commercial banks should actively change their business philosophy, deepen the financial market, reasonably make market positioning and behavioural decisions based on their development, and improve the market competitiveness.

Keywords: Internet finance · Commercial banks · Heterogeneous effects

1 Introduction

Internet finance (ITFIN), as an innovation from the Internet to the financial industry in the concept of "the Internet plus", accelerates the interpretation of the theory of evolution of the new financial system, and brings profound effects on the financial field. Nowadays, Internet finance has become an important part of the financial industry. Based on Internet technology, Internet enterprises can achieve a higher degree of financing, online payment and information transmission channels than traditional financial enterprises, and

H. Song and D. Jiang (Eds.): SIMUtools 2020, LNICST 369, pp. 636–650, 2021.
https://doi.org/10.1007/978-3-030-72792-5_50

gradually formed an Internet financial format represented by Internet payment, Internet financial management and network lending. Chinese economy is in a critical period of structural adjustment and transformation. as a rising star of the financial industry, ITFIN affects the traditional finance, which is mainly commercial banking business, with its unique operation mode and market transmission path. It has an impact on the profits of commercial banks that can not be ignored. So, how to measure the impact of ITFIN on the profits of commercial banks? Does the development of ITFIN change the profitability and its structure of commercial banks? Is there heterogeneity among different types of commercial banks (such as state-owned, joint-stock and municipal ones)? The answers to these questions are of great significance to how to maximize the role of ITFIN, how to integrate traditional commercial banks with emerging Internet technologies, and how regulators formulate policies to maintain the orderly and stable development of the financial market.

1.1 Related Literature

In essence, ITFIN is a financial model based on Internet technology (IETF) and information communication technology (ICT) [1]. Scholars' theoretical and empirical research on its definition, development, and its impact on the profitability of commercial banks are still being enriched.

The Internet finance definition first appeared in the literature written by N. Richard [2]. Since the emergence of ITFIN, scholars have studied the impact of ITFIN on the profitability of commercial banks from various angles, but have not reached a unified conclusion. According to the international mainstream, the impact of the ITFIN on bank profits is not negative, such as Chande [3], Momparler [4] and so on. According to Strategic Treasurer and Kyriba [5], the innovation of financial technology is changing the asset allocation structure of commercial banks, and has gradually approached the banking enterprises in terms of market share, which has become the biggest resistance and threat to their business development and profitability. As for Chinese studies, represented by Ba [6], Liang and Shen [7], Gong [8], Guo and Shen [9], the ITFIN and commercial banks can achieve win-win cooperation. They assume that financial enterprises use the Internet financial platform to develop customer resources, improve the efficiency of resource allocation and reduce operating costs; On the other hand, the cooperation between Internet enterprises and financial institutions can also enhance the cross-domain operation ability of enterprises. Studies represented by Qiu [10] and Zheng [11] believe that ITFIN has a negative impact on the commercial banks' earning. They holds that TPC, online financial products and other forms divert a large amount of demand deposits from commercial banks and push down the banks' earning of intermediary business. And the disintermediation of ITFIN also causes the loss of profit sources for commercial banks.

Most of these studies consider that different ITFIN models bring variety impacts on the business model, financial function and operating risk of commercial banks. However, they have not done a systematic analysis on banking structure under the trend of economic and social development, nor formed a complete market transmission path in the discussion on the impact of the development of Internet finance on the profitability of commercial banks. In recent years, although panel model has been used in empirical

researches, they mostly based on individual indicators such as assets, liabilities, or intermediary business of commercial banks from different forms of ITFIN. It is not based on the complete profit market transmission path of commercial banks yet.

1.2 Our Work

It can be seen that there are still various contradictions in empirical evidences, and studies have not reached a consensus on whether the impact is positive or negative. The existing literatures show that both sides are reasonable: the development of ITFIN has both positive and negative effects on the profits of commercial banks. It can be considered that the Catfish Effect and Cherry Picking Effect [12] of ITFIN on the profits of commercial banks exist at the same time, and the degree of this influence is related to the characteristics of the banks. Directly, the impact of ITFIN on the banking industry will be reflected in the profitability of commercial banks. Our study differs from the last mentioned studies in two ways following:

First, we start with the perspective of market structure in terms of theoretical analysis. We analyze the influence of ITFIN on the internal product pricing mechanism and product decision mechanism, the external market competitive environment and regulatory environment of commercial banks, and explore a complete path of this influence from a new perspective of market structure.

Second, we consider the influence of ITFIN in terms of empirical analysis. We establish a panel data model not only includes macro-economy, industry features and banks' characters, but also contains the Internet financial index, which is published by Wind. Our samples contain 16 commercial banks listed in China before the first year of Chinese Internet Finance era (2013). We focus particularly on different type of the banks, and give a factual evidence that the impact of ITFIN on them are heterogeneous. In general, the results show that the ITFIN has promoted the profitability of commercial banks and promoted the diversified development of commercial banks' profit structure. Respectively, it has greater effects on the profitability of the state-owneds while greater effects on the diversified development of the municipals.

2 Effects and Mechanism

"The first year of Chinese Internet Finance era" brought by Yu'ebao in 2013, and it marks the beginning of the rapid development of ITFIN in China. The traditional concept of "high-end" financial industry will be redefined by Internet technology and close to ordinary users infinitely [13]. In 2016, ITFIN was included in the outline of Chinese 13th five-year Plan, it mark the start of the recognition as a new economic form by Chinese Officials. As the "counterattack innovation" from the Internet to the financial industry in the concept of "Internet +". ITFIN accelerates the evolution of the financial system in the new era, and its profound impact on finance can never be ignored. By 2017, the scale of financial management in Chinese Internet financial industry was 3.15 trillion RMB, an increase of 52.39% over the same period last year, which only reached 10% of the remaining balance of 29.54 trillion RMB of banking wealth management products at same time. However, with professionalization, micromanagement and facilitation, the

financial management scale is expected to reach 15.5 trillion RMB in 2020, thus it will reach the 70% level of the existing balance of 22 trillion RMB of banking financial products at same time.

With the development of ITFIN, it has formed a financial model represented by Internet payment, Internet financial management and network lending, and it has penetrated into every involving economic life. Compared with the traditional financial market, ITFIN, which is innovative in multi-dimension and multi-level, can reduce the degree of information asymmetry between investors and financiers through big data, cloud computation and variety technologies. It changed the market environments of commercial banks and prompt them to change their behaviour to adapt to the volatile external environment.

2.1 Two-Sides Effects

On the positive side, the development of ITFIN will have a certain Catfish Effect on commercial banks. ITFIN activates the innovation and development momentum of commercial banks in product upgrading, customer service and the financial technology application, and improve the banks' ability of financial efficiency, service quality and risk management. Thus they can improve their own market competitiveness, and promote the profitability. According to Li [14], the Internet economy is born to satisfy the Long-tailed of Chinese demand market. The development of ITFIN in China has made full use of Blue Ocean Strategy to create new value and open up incremental market of the Long-tailed. The emergence of ITFIN makes the commercial banks have more diversified business models, more reasonable asset allocation and more accurate service concepts.

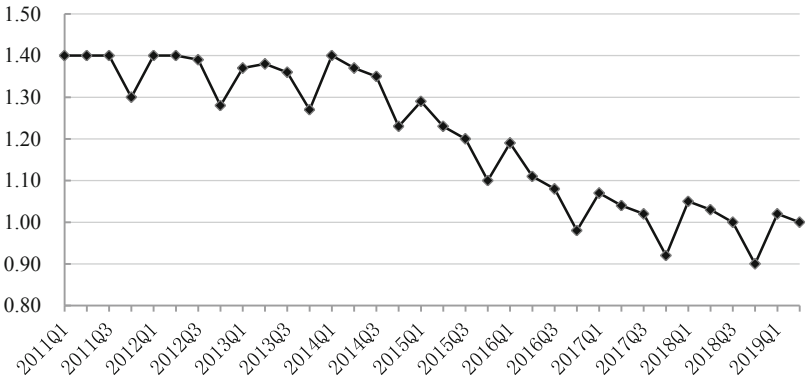

Fig. 1. ROA of Chinese commercial banks from 2011 to 2019 (%).

On the negative side, the impacts from ITFIN to banks are called Cherry Picking Effect, which make the Internet companies considering higher profits and lower risk when choosing products and cooperative banks. Through the way of investment and cooperation on high-quality assets, the financial magnates can achieve market monopoly, reduce competition, lower the barriers to entry or exit. Furthermore, the profits of commercial banks can be encroached. Figure 1 describes the return on assets (ROA) of Chinese

commercial banks from 2011 to 2019 (data from the China Banking Regulatory Commission), It is shown that ROA had drawn a downtrend line during 2011 and 2019. Especially during 2014 and 2017, it reduced by nearly 30% while ITFIN mushrooming. The most prominent negative impact is the occupation of the banks' asset, liability and intermediary business.

2.2 Transmission Paths

Because of the system transfer, the economy shunt and the structure adjustment of China in recent years, a multi-level and multi-channel mode has been formed in the way of financial development, which is dominated by the banking industry and supports the development of the real economy. However, commercial banks still have deficiencies in asset structure and asset quality. In recent years, the rapid development of ITFIN has brought a great challenge to the future of commercial banks [15]. According to the traditional industrial organization theory (TIO), market power is the inevitable result of enterprise monopoly, which is an important factor to transmit the loss of social welfare and lead to rent-seeking behavior. According to Xiao and Su [16], the key to the structure adjustment of China is to establish a competitive market structure, break the long-term monopoly pattern of state-owned banks, and set up an efficient resource structure that adapts to the market mechanism. With a unique market structure, ITFIN in China has a distinctive mechanism for the profits of commercial banks. With big data, cloud computation and mobile network technology, ITFIN has developed. It has change the internal and external market structure of commercial banks, which is the hypostatic transmission path of the impacts on banks' profits. The key to making this effect come true is that market strategies, which include development and asset allocation strategies, and services and supervision concepts, are made according to market structure. Thus, the profits of banks will be changed.

Figure 2 shows the transmission path of ITFIN's influence on the commercial banks' profits. The entrance of ITFIN has changed the market structure. With the *Blue Ocean Strategy*, it explored the *Long-tailed* of Chinese financial market and improved the degree of marketization of interest rates, affected the internal product pricing mechanism and product decision mechanism of commercial banks, formed financial disintermediation through the new platforms such as TPC, promoted the reform of the financial system by doing commercial activities, reduced the standard of entry or exit to change the external market competitive and regulatory environment.

In the process of the development of ITFIN, the positive *Catfish Effect* and the negative *Cherry Picking Effect* to the commercial banks are exist at the same time, and are closely related to its degree of development. On one hand, it stimulate banks to take more efficient strategies, Such as improving the resource allocation ability by improving the pricing mechanism of products, form a market-oriented exploitation of products by changing the traditional demands, improve the efficiency of their services and operating by intensifying the competition, and promote the formulation of market regulation policies that supporting their merger and acquisition to let the construction more rational.

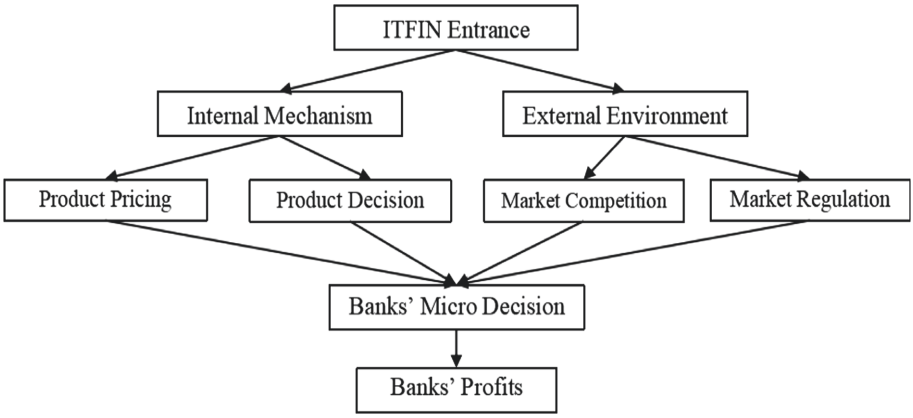

Fig. 2. Transmission paths of ITFIN's effects on the commercial banks' profits.

3 Data and Empirical Results

3.1 Basic Assumptions

Recent researches indicate that the factors that affect the profits of commercial banks include three aspects: macro-economy, industry features and banks' characters. In addition to them, the development of ITFIN is also an undeniable factor. Based on the theoretical analysis outlined above, we can build a panel data model to quantify and analyse the influence of ITFIN on the profits of commercial banks. To answer the question about how does the profitability and profit structure of commercial banks be affected, we make an assumption below:

H1: With the higher development of ITFIN, commercial banks have stronger profitability and more diversified profits structure.

In 2018, the total assets of Industrial & Commercial Bank of China (ICBC) have exceeded 27 trillion RMB, while those of small commercial banks generally do not exceed 100 billion RMB. So the differences among the scale of Chinese commercial banks are obvious. Relative to the scale, different commercial banks face to different external environment and make their own strategies in financial market. Relatively speaking, the large-scale banks have complex structures, and there will be a lag in decision-making when they face to the impact of ITFIN. While the small-scale banks are easy to adjust strategies in time to avoid the impact at the same time. According to Ma and Li [17], the large-scale banks are faced with the rigid constraint of national economic environment, and make strategy decisions highly consistent with the governmental policy guidance. On one hand, China is actively promoting the Internet + plan currently, what makes the enterprises choosing state-owned banks and joint-stock commercial banks with large scale. It brings not only the expansion of profit but also the promotion of risk to those banks. On the other hand, in response to changes, large-scale banks could design diversified products based on the scale advantages to avoid the impact of ITFIN. Compared with the small-scale banks, the large-scales have reached the higher level in the stability of the profit system, the ability of operation management

and the network technology. Thus, they can be relatively calm when facing to market shocks such as ITFIN. Most of the municipal banks are rooted in villages and towns, while the state-owned banks and joint-stock banks running online and offline products simultaneously. The impact from ITFIN depends on Internet technology, which is the shortage of villages and towns. These result in multiple situations to different banks. Based on the analysis above, we make another assumption below:

H2: There is heterogeneity in the impact of ITFIN on the profits of different types of commercial banks.

3.2 Variables

Dependent Variables. In order to quantify the profitability of commercial banks, it is divided into profitability and profit structure.

As for profitability, theoretical analysis shows that there are many indicators that can be selected. According to the research of DeYoung and Rice [18], we choose the return on assets as the evaluation index of the profitability of commercial banks.

As for profits structure, non-interest income ratio is mostly used in the literature. But nowadays, the calculation and analysis based on it are not representative enough. Therefore, we build the profit structure index symbolled by *prostr* calculated as formula (1), considering the situation of assets, liabilities and intermediary business of commercial banks. Thus we can make an in-depth calculation and analysis of the profit structure of banks.

$$prostr = \left(\frac{NI}{Businc}\right)^2 + \left(1 - \frac{NI}{Businc}\right)^2 \tag{1}$$

Noted that *NI* is the non-interest income, and *Businc* is the total operating income.

Independent Variables. The development degree of ITFIN, symbolled by *intfi*, is the core independent variable of the model. ITFIN is still a new industry in the stage of rapid development, so the academic circles have not reached a unified consensus on the measurement indicators of its level. Considering the representativeness of indicators and the availability of datum, we select the Internet financial index published by *Wind* database.

Control Variables. According to the research method of Xing [19] on the profitability of commercial banks, we select control variables both external and internal facts.

The external control variables include two parts: one is the macroeconomic level; the other is the banking level. At the macroeconomic level, we choose the year-over-year growth of GDP to reflect the economic level, and the consumer price index to reflect the degree of stability of economic system. At the banking level, we divide Herfindahl Index by 10000 to reflect the market structure of banking. Referring the viewpoint from Yidirim and Philippatos [20] on the degree of direct financing, we choose indicators to measure the development of the stock market and the insurance market. The former is expressed by the ratio of stock market value to GDP, while the latter is expressed by the ratio of insurance premium income to GDP. As for the internal control variables, they mainly describe the operating conditions of commercial banks, including five variables:

the logarithm of total assets reflect assets scale, the capital adequacy, the cost-income ratio of bank reflect operating efficiency, the loan-to-deposit ratio of bank reflect assets structure and the non-performing loan ratio of bank reflect capital risk level (Table 1).

Table 1. List of variables.

Name	Symbol	Interpretation
Profitability of banks	*roa*[1]	The return on assets
Profit structure of banks	*prostr*[1]	Calculated by formula (1)
ITFIN's degree	*intfi*[2]	Internet financial index
Economic development level	*gdpg*[3]	Year-over-year growth of GDP
The stability of economic system	*cpi*[3]	Consumer price index
Market structure of banking	*hhi*[3]	Dividing Herfindahl Index by 10000
The degree of direct financing in stock market	*stock*[3]	Ratio of stock market value to CDP
Assets scale	*cta*[3]	Logarithm of total assets
Capital adequacy	*car*[3]	Capital adequacy
Operating efficiency	*cir*[3]	Cost-income ratio of bank
Assets structure	*cdr*[3]	Loan-to-deposit ratio of bank
Capital risk level	*npl*[3]	Non-performing loan ratio of bank

Noted that [1] marks of dependent variables, [2] marks of independent variables, [3] marks of control variables

3.3 Data Source

Our sample contains 16 commercial banks listed in China before the first year of Chinese Internet Finance era (2013), Table 2 shows the samples include 5 state-owned commercial banks (Industrial and Commercial Bank, China Construction Bank, Agricultural Bank of China, Bank of China, Bank of Communications) and 8 joint-stock commercial banks (China Merchants Bank, China Industrial Bank, Shanghai Pudong Development Bank, China CITIC Bank, China Minsheng bank, China Everbright Bank, Ping An Bank, Huaxia Bank) and 3 municipal commercial banks (Beijing, Nanjing, Ningbo). The datum period is from 2010 to 2018, based on quarterly datum. Deleting some missing samples, 548 valid samples were obtained.

The financial datum of commercial banks and ITFIN's degree are derived from the Wind and Resset database, while the GDP and CPI are derived from the National Statistics Bureau.

Through descriptive statistical and correlation analysis of variables, it can be found that the gap between the maximum and minimum of *prostr* and *roa* is obvious, which preliminarily shows that there are differences in profitability and profit structure of different commercial banks. In addition, because the gap between the maximum value and the minimum value of the *intfi* variable is too large, the natural logarithm of *intfi*, the *lnintfi*, is taken in the empirical analysis.

Table 2. List of sample banks description.

No.	Symbol	Name	Listing date
1	000001.SZ	Ping An Bank	1991-04-03
2	002142.SZ	Ningbo Bank	2007-07-19
3	600000.SH	Shanghai Pudong Development Bank	1999-11-10
4	600015.SH	Huaxia Bank	2003-09-12
5	600016.SH	China Minsheng bank	2000-12-19
6	600036.SH	China Merchants Bank	2002-04-09
7	601009.SH	Nanjing Bank	2007-07-19
8	601166.SH	China Industrial Bank	2007-02-05
9	601169.SH	Beijing	2007-09-19
10	601288.SH	Agricultural Bank of China	2010-07-15
11	601328.SH	Bank of Communications	2007-05-15
12	601398.SH	Industrial and Commercial Bank	2006-10-27
13	601818.SH	China Everbright Bank	2010-08-18
14	601939.SH	China Construction Bank	2007-09-25
15	601988.SH	Bank of China	2006-07-05
16	601998.SH	China CITIC Bank	2007-04-27

3.4 Econometric Model and Results

Based on the analysis above, a Panel Data Model was applied to analyse the impact of ITFIN on the profitability and profits structure if commercial banks. The following formula (2) and (3) are used to analyse both the whole datum and the heterogeneity of banks in different subgroups.

$$roa_{i,t} = \beta_0 + \beta_1 lnintfi_{i,t} + \sum_{k=2}^{10} \beta_k X_{ikt} + \varepsilon_{it} \tag{2}$$

$$prostr_{i,t} = \beta_0' + \beta_1' lnintfi_{i,t} + \sum_{k=2}^{10} \beta_k' X_{ikt} + \varepsilon_{it}' \tag{3}$$

Where i and k are the counter items, t represents time, ε is an error term, and β is the coefficient. Dependent variables are *roa* and *prostr*. Independent variable is *lnintfi*. X are control variables.

Full Samples' Regression Analysis. First, we need to verify the assumption that with the higher development of ITFIN, commercial banks have stronger profitability and more diversified profits structure. We use the least square method, fixed effect and random effect to regression respectively. F-test and *Hausman* test were present the setting form of the model was the fixed effect model.

Table 3. Regression results of full samples.

Roa				Prostr			
lnintfi	0.00366***	*cta*	−0.000974	*lnintfi*	0.0180**	*cta*	−0.0404***
	(7.843)		(−01.144)		(2.392)		(−06.700)
gdpg	−0.0806***	*car*	0.0611***	*gdpg*	0.0512	*car*	1.121***
	(−03.927)		(4.925)		(0.150)		(5.981)
cpi	0.0332***	*cdr*	−0.00256	*cpi*	−0.349*	*cdr*	−0.0756**
	(3.063)		(−01.266)		(−01.926)		(−02.431)
hhi	0.0530***	*cir*	0.0411***	*hhi*	1.120***	*cir*	0.278***
	(2.987)		(10.75)		(5.086)		(4.568)
stock	−0.00449***	*npl*	0.122**	*stock*	−0.0150**	*npl*	−05.276***
	(−011.49)		(2.330)		(−02.348)		(−06.201)
		Constant	−0.0416			Constant	1.711***
			(−01.375)				(6.152)
R-squared		0.820		R-squared		0.772	
Number of id		16		Number of id		16	

Noted that ***, **, * refer to significant correlations at significance levels of 1%, 5%, and 10%, respectively

Table 3 reports the regression results of full samples. It shows that the development of ITFIN has a significant positive effect on the profitability of commercial banks, and a significant negative decentralized effect on the profits structure. This shows that the development of Internet finance in China has brought diversified changes to the profit structure of commercial banks, as well as a high level of profitability.

Regression Analysis of Subgroups. By means of subgroup regression of state-owned, joint-stock and municipal banks, we analyse the heterogeneity of the impacts on different types of commercial banks.

Table 4. Regression results of full subgroups.

Variables	Roa		
Subgroup	State-owned	Joint-stock	Municipal
lnintfi	0.00231***	0.00320***	0.000686
	(3.885)	(4.286)	(1.100)
gdpg	−0.0525**	−0.0850**	−0.140***
	(−2.100)	(−2.360)	(−5.517)
cpi	0.0364***	0.0416***	0.0174
	(2.698)	(2.612)	(0.704)

(*continued*)

Table 4. (*continued*)

hhi	−0.126***	−0.0326	−0.123*
	(−4.084)	(−0.965)	(−1.815)
stock	−0.00235***	−0.00429***	−0.00388***
	(−4.286)	(−7.381)	(−4.415)
cta	−0.0206***	−0.00652***	−0.0109***
	(−6.875)	(−3.439)	(−3.405)
car	0.110***	0.0567***	0.0620***
	(4.522)	(3.148)	(2.892)
cdr	−0.000947	−0.00510	0.00174
	(−0.243)	(−1.554)	(0.440)
cir	0.0757***	0.0271***	0.0312***
	(14.47)	(4.848)	(3.044)
npl	−0.284***	0.0599	−0.607**
	(−3.285)	(0.579)	(−2.496)
Constant	0.581***	0.139**	0.281***
	(5.944)	(2.196)	(2.768)
Observations	177	277	92
R-squared	0.756	0.397	0.538
Number of id	5	8	3

Variables	*prostr*		
Subgroup	State-owned	Joint-stock	Municipal
lnintfi	0.00561	−0.00908	0.0489*
	(0.566)	(−1.009)	(1.974)
gdpg	0.370	0.0369	−3.805***
	(0.888)	(0.0851)	(−3.554)
cpi	−0.242	−0.104	−0.814
	(−1.075)	(−0.544)	(−1.404)
hhi	−1.351***	0.888**	9.646***
	(−2.623)	(2.184)	(6.080)
stock	−0.00871	0.00208	−0.0622***
	(−0.953)	(0.297)	(−3.026)

(*continued*)

Table 4. (*continued*)

cta	−0.279***	−0.0756***	0.330***
	(−5.591)	(−3.310)	(4.409)
car	1.651***	0.854***	0.387
	(4.061)	(3.941)	(0.771)
cdr	−0.133**	−0.111***	0.0824
	(−2.049)	(−2.808)	(0.889)
cir	0.248***	0.142**	0.482**
	(2.846)	(2.100)	(2.014)
npl	−3.443**	−2.172*	16.01***
	(−2.389)	(−1.743)	(2.814)
Constant	9.391***	2.754***	−9.905***
	(5.763)	(3.619)	(−4.168)
Observations	177	277	92
R-squared	0.600	0.906	0.710
Number of id	5	8	3

Noted that ***, **, * refer to significant correlations at significance levels of 1%, 5%, and 10%, respectively

Table 4 reports the regression results of subgroups. We can find that the impacts of ITFIN on different banks are heterogeneous, and the ITFIN has greater effects on the profitability of the state-owneds while greater effects on the diversified development of the municipals than others.

The empirical results present that the profits of commercial banks will be affected by ITFIN, and the positive effects are greater than the negative impacts. Due to the differences in market positioning and marketing strategies among the state-owned, joint-stock and municipal banks, the changes in profitability and profits structure are heterogeneous when they faced to the effects from ITFIN. The effects on the profitability of state-owneds are more significant, while the effects on the diversified development of the municipals are more favorable.

Robustness Check. In order to check for the validity of the aforementioned findings, we conducted a robustness check. We estimate the alternative profit frontier model. This specification uses the same explanatory variables as the function above and *roe* as the explained variable. Table 5 reports the regression results of re-estimation. The results are generally consistent with the aforementioned findings, and indicate that the results of this model are reliable.

Table 5. Regression results of full samples.

Variables	*roe*			
Subgroup	Full samples	State-owned	Joint-stock	Municipal
lnintfi	0.0531***	0.0268***	0.0420***	0.0743***
	(6.961)	(3.072)	(3.296)	(4.168)
gdpg	−1.109***	−0.868**	−1.481**	−0.783
	(−3.307)	(−2.361)	(−2.409)	(−1.018)
cpi	0.464***	0.570***	0.649**	−0.0792
	(2.619)	(2.878)	(2.390)	(−0.190)
dls	0.979***	−1.733***	−0.625	−0.708
	(3.375)	(−3.815)	(−1.085)	(−0.621)
hhi	−0.0661***	−0.0285***	−0.0633***	−0.0704***
	(−10.34)	(−3.539)	(−6.372)	(−4.767)
stock	8.67e−05	−0.299***	−0.126***	−0.106*
	(0.00622)	(−6.791)	(−3.882)	(−1.966)
cta	0.473**	1.097***	0.417	0.613*
	(2.334)	(3.063)	(1.359)	(1.700)
car	−0.0694**	−0.00552	−0.122**	−0.00212
	(−2.097)	(−0.0962)	(−2.175)	(−0.0318)
cdr	0.661***	1.151***	0.455***	0.565***
	(10.58)	(14.98)	(4.761)	(3.285)
cir	1.155	−4.416***	1.759	−10.13**
	(1.352)	(−3.477)	(0.996)	(−2.476)
npl	−0.976**	8.466***	3.016***	2.722
	(−1.972)	(5.895)	(2.798)	(1.593)
Constant	546	177	277	92
	0.437	0.771	0.410	0.464
Observations	548	178	277	93
R-squared	0.8331	0.8575	0.8293	0.8420
Number of id	16	5	8	3

Noted that ***, **, * refer to significant correlations at significance levels of 1%, 5%, and 10%, respectively

4 Conclusion and Implication

Chinese economy is in a critical period of structural adjustment and transformation, as a rising star of the financial industry, ITFIN affects the traditional finance, which is mainly commercial banking business. Our work started with the perspective of market structure

in terms of theoretical analysis. We analysed the influences of ITFIN on the internal product pricing mechanism and product decision mechanism, the external market competitive and regulatory environment of commercial banks, and explored a complete path of this influence from a new perspective of market structure. Our work considered the influence of ITFIN in terms of empirical analysis, established a panel data model not only includes macro-economy, banking features and banks' characters, but also contains the Internet financial index.

Our empirical analysis has produced some findings. First, the development of ITFIN has both positive and negative effects on the profits of commercial banks, which generally promotes the profitability and the diversification of their profits structure. Although the profit margins of banks have declined in recent years, the decline is not mainly due to ITFIN. Through improving product pricing mechanism, the resource allocation capacity of commercial banks has been improved. By changing the traditional decision-making mechanism, banks can develop into a user-oriented mode. What's more, ITFIN has changed the competition and supervision mechanism of financial market, which makes banks improving their efficiency significantly. Banks should pay more attention to the cooperation with non-bank institutions and enhance their market competitiveness. Second, ITFIN impacts the profits of commercial banks through the hypostatic transmission path, and there is heterogeneity in the degree of different types. We found that there are greater effects on the profitability of the state-owneds and greater effects on the diversified development of the municipals. This is owing to the reasons following: with large scales, the state-owned commercial banks pay more attention to the risk avoidance of investment decisions, and have higher level of operation management ability and network technology. Compared with municipal banks, the large-scales have reached the higher level in the stability of the profit system. Conversely, the businesses of municipal banks are mainly existed in villages and towns, where has more rapidly promoting web, which is the backward region before. And in the increasingly fierce market competition, their external cooperation ability and product innovation ability grow faster.

We also draw some implications about the development of the commercial banks in China. First, it requires the enterprise to classify the financial market. Shareholders and management should improve the ability of asset allocation, classify the financial market, and refine product positioning to meet the multiple demands of customers. Second, it requires the FinTech to achieve a win-win condition. Shareholders and management better do follow the high-tech in decision making, cooperate with Internet firms to elevate the level of financial science and technology, and provide customers with more efficient, safe and convenient financial services. Finally, it requires marshalling resources to optimize the banking structure. Companies can promote the formulation of market regulation policies to get the rational construction and improve the mechanism for transmitting monetary policy.

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