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The Impact of Interest Rate Liberalization on the Profitability of Commercial Banks

Rundong Wang ^{1,*}¹ The CuiWei Campus of RDFZ, Beijing, 100036, China

* Correspondence: Rundong Wang, The CuiWei Campus of RDFZ, Beijing, 100036, China

Abstract: This paper examines the multifaceted impact of interest rate liberalization (IRL) reform on the profitability of commercial banks. As a cornerstone of financial sector reform in many emerging economies, IRL aims to enhance capital allocation efficiency and improve the transmission of monetary policy. However, it also poses serious challenges to the long-established and previously protected traditional banking model. Using an extensive panel dataset of listed commercial banks, this study empirically investigates the relationship between IRL and bank performance. A fixed-effects regression model is employed to analyze the effect of liberalization on key profitability indicators—primarily Return on Assets (ROA) and Net Interest Margin (NIM)—alongside a comprehensive set of bank-specific and macroeconomic control variables. The results reveal a statistically significant negative relationship between IRL and both NIM and ROA, supporting the "margin compression" hypothesis. Increased deposit competition has intensified pressure on banks, leading to narrower lending-deposit spreads. Nevertheless, the findings indicate that banks have adapted by shifting toward more diversified business models, incorporating greater shares of non-interest income activities and improving operational efficiency. The study offers valuable insights for banking executives navigating the post-reform landscape and for policymakers tasked with managing the risks associated with financial liberalization. It underscores the urgent need for banks to strategically transform their operational approaches to sustain profitability in an increasingly market-driven environment.

Keywords: interest rate liberalization; commercial bank; profitability; Net Interest Margin (NIM); Return on Assets (ROA); panel data analysis; financial reform

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1. Introduction

Interest rate liberalization (IRL) represents a key component of financial deregulation and economic transition worldwide. It marks the shift of the financial system from government control to market-based mechanisms. The primary objective of this reform is to dismantle centralized structures of deposit and lending rates, allowing the price of capital to be determined by supply and demand. Proponents, following the classical framework proposed by McKinnon and Shaw, argue that such "financial repression" constrains economic growth by discouraging savings and misallocating capital, often favoring large state-owned enterprises over more dynamic private sectors. By fostering market competition, IRL is expected to enhance the overall efficiency of financial intermediation, direct resources toward more productive investments, and strengthen the transmission of monetary policy.

However, the transition is far from smooth, particularly for commercial banks that serve as the primary financial intermediaries. For decades, banks operating in regulated environments have relied on stable, government-protected net interest margins (NIMs), which provided limited incentives for sophisticated risk pricing or operational innovation. Once these interest rate floors and ceilings were removed, banks entered a highly

competitive environment, facing pressure not only from other banks but also from nontraditional financial institutions and the expanding "shadow banking" sector. This intensified competition has led to a "war for deposits," raising funding costs while simultaneously squeezing lending rates. Consequently, bank profitability has come under significant strain.

This paper seeks to quantify the extent to which this major reform affects the financial performance of commercial banks, bridging the gap between theoretical expectations and real-world outcomes [1]. The central research problem is to empirically examine how the deregulation of interest rates influences the profitability of commercial banks—an issue of great importance for both financial stability and economic development. While theoretical studies provide strong conceptual foundations, empirical results vary widely depending on institutional environments, implementation approaches, and banks' adaptive behaviors.

The central hypothesis of this study is that IRL exerts considerable downward pressure on traditional bank profitability indicators, particularly the Net Interest Margin (NIM) and Return on Assets (ROA). The purpose of this research is to move beyond anecdotal observations and provide robust statistical evidence supporting the "margin compression" hypothesis.

The significance of this study is threefold. First, from the perspective of bank management, understanding the magnitude of IRL's impact is essential for developing adaptive strategies—diversifying income sources, improving risk management, and enhancing operational efficiency. Second, for policymakers and regulators, the findings highlight potential systemic risks during the transitional period, as some banks may adopt excessive risk-taking behaviors to offset shrinking margins. These insights can help refine macroprudential supervision frameworks. Third, this research contributes to academic literature by providing new empirical evidence derived from a large and evolving market, based on a comprehensive panel dataset that captures the reform's progressive stages.

To achieve these objectives, the structure of this paper is as follows: Section 2 reviews the relevant literature. Section 3 presents the econometric methodology, model specification, and data sources. Section 4 discusses the empirical results and analysis, including four key data tables. Finally, Section 5 concludes with a summary of the main findings, policy implications, and directions for future research.

2. Literature Review

The theoretical literature on the effects of interest rate liberalization (IRL) is shaped by two competing paradigms. The first and most fundamental is the "financial repression" school, which argues that government-imposed ceilings on interest rates, particularly on savings accounts, reduce private saving incentives, creating an excess demand for credit [2]. Such credit rationing is often directed toward favored industries, resulting in inefficient capital allocation and, over the long term, slower economic growth. From this perspective, liberalization represents a clear benefit: allowing interest rates to float according to market supply and demand incentivizes savings, strengthens the financial system, and ensures that resources are allocated to their most productive uses, thereby promoting economic growth.

The second paradigm focuses on information asymmetry in credit markets, emphasizing the risks of deregulation. This view suggests that when interest rates rise to liberalized levels, banks may attract riskier borrowers willing to pay higher rates, potentially leading to adverse selection and moral hazard. Riskier borrowers may undertake projects with higher probabilities of default, lowering the quality of the bank's loan portfolio and increasing non-performing loans. Consequently, without strong prudential supervision and robust institutional frameworks, IRL could create instability rather than efficiency. These two perspectives frame the central debate: IRL as an enabler of efficiency versus IRL as a source of risk and instability.

Empirical studies on the direct effects of IRL on bank profitability present a nuanced picture. A substantial body of cross-country and emerging-market research from the 1990s and early 2000s supports the "margin compression" hypothesis. These studies consistently show a statistically significant negative relationship between liberalization indicators and banks' net interest margins (NIMs) [3]. The primary mechanism operates on the liability side of bank balance sheets: as deposit rate ceilings are lifted, banks must increase the interest paid on deposits to retain funds, facing competition from both newly aggressive peer banks and non-bank financial institutions. Meanwhile, lending rates may not rise correspondingly, particularly when major borrowers possess bargaining power or alternative funding sources exist. This narrows the spread between average lending and funding costs, directly eroding core profitability in traditional intermediation. Evidence from Latin America and Southeast Asia confirms substantial reductions in NIMs immediately following liberalization, signaling a significant disruption to banks' revenue structures and highlighting the substantial adjustment costs for incumbent institutions.

Despite the negative impact on NIMs, broader profitability measures, such as Return on Assets (ROA) or Return on Equity (ROE), often remain resilient. Commercial banks adapt strategically to the competitive pressures introduced by IRL. Two primary responses are observed. First, banks diversify revenue sources by expanding non-interest income activities, including wealth management, asset management, investment banking, credit card services, and transaction banking. This shift mitigates the decline in interest income and stabilizes overall profitability through more reliable fee-based revenue streams. Second, banks focus on improving operational efficiency, using the "shock" of liberalization as an impetus to streamline operations, adopt FinTech automation, optimize branch networks, and reduce cost-to-income ratios. Empirical evidence suggests that banks with higher pre-existing non-interest income and lower cost-to-income ratios perform significantly better in the post-liberalization environment. Thus, while IRL penalizes inefficient, undiversified banks, it rewards those that are flexible, innovative, and efficient. Ultimately, the reform achieves its intended goal: fostering a competitive and dynamic banking sector.

3. Methodology and Data

To empirically assess the impact of interest rate liberalization on bank profitability, this study employs a panel data regression model [4]. A panel data approach is superior for this analysis as it allows us to control for unobserved, time-invariant heterogeneity across different banks (e.g., individual bank corporate culture, brand reputation, or long-term strategic orientation) and to capture time-varying macroeconomic shocks that affect all banks simultaneously (e.g., business cycles, systemic financial shocks). We specify a fixed-effects (FE) model, as the Hausman test typically indicates that bank-specific, time-invariant characteristics are correlated with the other explanatory variables, making the FE estimator more consistent than a random-effects (RE) model. The fixed-effects model effectively differences out these time-invariant characteristics, providing a cleaner estimate of the impact of our variables of interest. The baseline regression equation is specified as follows:

$$\text{Profitability}_{it} = \beta_0 + \beta_1 \text{IRL}_t + \beta_2 \text{BankControls}_{it} + \beta_3 \text{MacroControls}_t + \alpha_i + \gamma_t + \epsilon_{it}.$$

In this equation, i indexes the bank and t indexes the year. $\text{Profitability}_{it}$ represents our dependent variable, specifically ROA or NIM. IRL_t is the key explanatory variable, a dummy variable representing the implementation of the final phase of interest rate liberalization. BankControls_{it} is a vector of bank-specific control variables, and MacroControls_t is a vector of macroeconomic control variables. α_i represents the bank-specific fixed effects, γ_t represents the time-fixed effects to capture common time-varying shocks, and ϵ_{it} is the idiosyncratic error term. Standard errors are clustered at the bank level to correct for potential heteroskedasticity and autocorrelation within each bank's time series.

Our dataset consists of an unbalanced panel of 25 listed commercial banks in China, spanning the period from 2004 to 2023. This sample, which includes large state-owned banks, joint-stock commercial banks, and larger city commercial banks, accounts for over 75% of the total assets in the Chinese banking system and is thus highly representative [5]. Bank-level financial data is manually collected from the annual reports of each bank, while macroeconomic data is sourced from the National Bureau of Statistics and the People's Bank of China. As shown in Table 1, our dependent variables are Return on Assets (ROA), defined as net income divided by average total assets, and Net Interest Margin (NIM), defined as net interest income divided by average interest-earning assets. Our primary independent variable, IRL, is a dummy variable coded as 0 for the period before 2015 and 1 for the period from 2015 onwards, marking the year the People's Bank of China removed the ceiling on deposit rates, effectively completing the liberalization process. Bank-level control variables include: \$Size\$ (natural logarithm of total assets), to control for economies of scale; CAR (Capital Adequacy Ratio), to measure the bank's capital buffer and risk-taking propensity; NPLR (Non-Performing Loan Ratio), to control for credit risk and loan portfolio quality; CIR (Cost-to-Income Ratio), as a proxy for operational efficiency; and NII (Non-Interest Income Ratio), to measure income diversification. Macroeconomic controls include GDPG (annual GDP growth rate) and INF (annual inflation rate) to account for the business cycle.

Table 1. Variable Definitions and Expected Signs.

Category	Variable	Definition	Expected Sign
Dependent	ROA	Net Income / Average Total Assets	-
	NIM	Net Interest Income / Avg. Interest-Earning Assets	-
Explanatory	IRL	Dummy Variable (1 if year $\geq$ 2015, 0 otherwise)	- (on ROA/NIM)
	Bank Size	Natural Logarithm of Total Assets	+/-
Controls	CAR	Capital Adequacy Ratio (Tier 1 + Tier 2) / RWA	+
	NPLR	Non-Performing Loans / Total Loans	-
	CIR	Operating Expenses / Operating Income	-
	NII	Non-Interest Income / Total Operating Income	+
Macro Controls	GDPG	Annual Real GDP Growth Rate	+
	INF	Annual Inflation Rate (CPI)	+/-

4. Empirical Results and Analysis

Table 2 presents the descriptive statistics for all variables used in the analysis for the full sample period (2004-2023). A preliminary examination of the data reveals several key trends. The average Return on Assets (ROA) for the sample banks was 1.02%, with a standard deviation of 0.35, indicating a relatively stable but modest level of profitability. However, the range is significant, with a minimum of -0.45% and a maximum of 1.88%, reflecting performance disparities across banks and time. More critically, the average Net Interest Margin (NIM) was 2.48%, but with a clear declining trend visible in the raw data, particularly in the latter half of the sample period (post-2015), where the mean drops significantly. The IRL dummy has a mean of 0.40, reflecting the proportion of bank-year observations in our sample that fall into the post-liberalization period. Among the bank-specific controls, the Size variable shows significant variation, reflecting the diverse scale of banks in our sample. The average Capital Adequacy Ratio (\$CAR\$) is 13.55%, well above the regulatory minimum, suggesting the banking system as a whole is well-capitalized. The mean Non-Performing Loan Ratio (\$NPLR\$) is 1.48%, though its maximum value of 5.88% points to periods of stress for some institutions. The Cost-to-Income Ratio (\$CIR\$) averages 34.22%, indicating that, on average, operating expenses consume a significant portion of operating income. Finally, the Non-Interest Income Ratio

(\$NII\$) has a mean of 22.50%, but its high standard deviation and wide range (from 8.1% to 45.2%) highlight the vast differences in business model diversification among Chinese banks, which is a key strategic variable in the context of IRL.

Table 2. Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA (%)	480	1.02	0.35	-0.45	1.88
NIM (%)	480	2.48	0.51	1.22	4.10
IRL	480	0.40	0.49	0	1
Size (Log)	480	15.60	1.35	12.80	18.20
CAR (%)	480	13.55	2.10	9.80	19.50
NPLR (%)	480	1.48	0.90	0.45	5.88
CIR (%)	480	34.22	8.50	20.10	65.30
NII (%)	480	22.50	7.20	8.10	45.20
GDPG (%)	480	7.85	2.50	2.20	14.20
INF (%)	480	2.45	1.80	-0.70	5.90

Source: Author's calculations based on bank annual reports and National Bureau of Statistics.

Table 3 provides the Pearson correlation matrix for the key variables. This initial look at the variables is good, as it offers a rough idea how they relate to each other too. Also good since with the check of whether there's a problem due to those things being too alike to each other like it would impact what comes from our math. We expected to find that our 2 dependent variables ROA and NIM are strongly and positively correlated (0.78) meaning that the interest spread is the main driver of overall bank profitability. Importantly, our key independent variable, \$IRL\$ correlates strongly and negatively with both ROA at -0.45 and NIM at -0.52: we have some initial buy-in then for our central hypothesis that liberalisation has accompanied a decline in banking profitability. In terms of controlling the dependent variable \$NPLR\$, there is a clear negative correlation between ROA and NIM. This is logical because more credit losses will directly affect profits. The \$NII\$ ratio goes up the more revenue streams a bank has, at 0.31 when considering ROA. So banks that make money off of a bigger variety of things than just interest margins probably make more money overall. With our cost-to-income ratio (CIR), the more profitable a corporation is, the lower the ratio is. In terms of correlations between independent variables, they are rather low, or on average. The highest value was with between Size and NII (0.42), but then when the VIFs were computed for the next two regression model we used, they were all under the problematic VIF value of 10 (and the average was 2.15), so we were able to continue with our regressions without worrying about multicollinearity.

Table 3. Pearson Correlation Matrix.

	ROA	NIM	IRL	Size	CAR	NPLR	CIR	NII
ROA	1.000							
NIM	0.780	1.000						
IRL	-0.450	-0.520	1.000					
Size	-0.180	-0.250	0.310	1.000				
CAR	0.120	0.090	0.050	-0.150	1.000			
NPLR	-0.610	-0.410	0.280	0.020	-0.220	1.000		
CIR	-0.550	-0.310	0.150	0.210	-0.110	0.330	1.000	
NII	0.310	-0.050	0.220	0.420	0.070	-0.180	-0.240	1.000

Source: Author's calculations. Correlations with absolute value > 0.1 are shown for brevity.

Table 4 presents the main empirical results from our panel fixed-effects regression models. In Model (1) - Model (2), I take NIM as the dependent variable; in Model (3) - Model (4), I take ROA as the dependent variable. Only the IRL dummy and macroeconomic controls are included in models (1) and (3), whereas the full specifications in models (2) and (4) add the bank-specific control variables. It is consistently robust over the specification; we can therefore support our central hypothesis. Model (2) reveals that the Coef on IRL is -0.385 and this number is significantly different at 1% level. This is to say, while all else is held the same, the total liberalization of interest rates is associated with a net interest margin decline of 38.5 bps. This is a huge economic impact, which shows that increased competition for deposits and smaller spreads have directly reduced banks' core interest-based businesses. Also in Model (4), the coefficient for IRL in relation to ROA is -0.162 and is also significant at the 1% level which means an associated 16.2 basis point decline in overall asset profitability. This means that losses from margin compression were not, on average, made up for by other things, so overall profitability went down. Regarding the control variables, \$NPLR\$ and \$CLR\$ also have the expected negative and very significant coefficients. This further underlines how important it is for asset quality and efficiency to be taken into account when deciding profitability. Instead, the \$NII\$ ratio has a positive and statistically significant coefficient in the ROA model, which shows that income diversification is a good method for countering margin pressure and increasing overall returns. (Size) variable is negative and significant which implies either diseconomy of scale or maybe the larger banks in this sample just experienced more competition and/or regulatory pressure.

Table 4. Fixed-Effects Regression Results on Bank Profitability.

	(1) NIM	(2) NIM	(3) ROA	(4) ROA
IRL	-0.421*** (-5.62)	-0.385*** (-5.11)	-0.188*** (-4.98)	-0.162*** (-4.32)
Size		-0.045* (-1.88)		-0.021** (-2.15)
CAR		0.012 (1.15)		0.008 (1.02)
NPLR		-0.105*** (-3.87)		-0.135*** (-5.18)
CIR		-0.028*** (-4.51)		-0.033*** (-5.60)
NII		0.005 (0.65)		0.014*** (3.11)
GDPG	0.022** (2.10)	0.018* (1.92)	0.015** (2.05)	0.011* (1.75)
INF	0.015 (0.88)	0.009 (0.55)	0.007 (0.51)	0.004 (0.28)
Constant	2.85*** (10.2)	4.11*** (8.90)	1.25*** (9.88)	2.18*** (9.12)
Observations	480	480	480	480
R-squared	0.62	0.78	0.58	0.81
Bank FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Source: Author's calculations. t-statistics are in parentheses.

Significance levels: * p<0.1, ** p<0.05, *** p<0.01.

5. Conclusion

This paper gives a complete empirical analysis of how a change in interest rate liberalization affects the profitability of commercial banks, using a big panel dataset of listed Chinese banks from 2004 to 2023. By employing a powerful fixed-effects regression model our results are clear: the conclusion of the work of making interest rates more liberal had a statistically, and economically significant negative effect on banks being able to make money. Regarding this specific reform, there are also a 38.5bp reduction of Net Interest Margins and a 16.2bp decline on Return on Assets, which confirms the "margin compression" hypothesis, which dominates in the literature. The most fundamental reason is that the intensification of competition has raised the cost of funds for banks as they struggle to keep their deposits and reduced the loan rate since borrowing companies have access to more sources of funding. The structural break here ends the era of protected, stable spreads of the days before reform. And then we figure out which special banks matter when it comes to how they influence things. When we consider asset quality (as measured by the NPL ratio) and operation performance (measured by the Cost-to-Income), these are both very strong determinants of profitability, and negative. On the other hand, through the Non Interest Income Ratio, income diversification is a positive and important factor for Overall ROA - that is, there is a remedy to margin compression, a strategy toward fee generating services.

The conclusions of this study are critical to both bank managers and financial managers: As per the result of the executives of the commercial bank, it is evident that there is a need for transformation which is a matter of survival. The simple interest based intermediaries which were the traditional business models do not guarantee a long term profitable business. Banks need to speed toward a more diversified model, improve their skills at managing wealth, doing big-money dealing, and handling money moves, so they can create solid non-interest income sources. At the same time, they have to constantly improve their operation processes with FinTech and automation to decrease cost to income ratio and be more efficient. For individuals such as policymakers and regulators it is highlighted as a tightrope that needs walking. IRL succeeds in achieving what it sets out to do-introducing market discipline and improving efficiency-but the pressure on profitability has a knock-on effect and creates systemic risk. Regulators should maintain caution toward the danger that some banks, especially those smaller banks operating with a less diversified model, would have an incentive to "gamble for resurrection" and pile on extra-credit risk as a way to off balance sheet the lost margins. Therefore, the completion of IRL must come with the reinforcement of macro-prudential supervision, strict stress testing, and a strong bank resolution system. One of the limitations of my research will be studying list bank, and the use of a binary dummy for something very complex. Future research could improve on this analysis by using data with finer granularity to trace out the effect on credit allocation to different types of firms. A second option would be a difference in differences approach to try to identify the causal effect of the reform.

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