

## Analysis of the Effects of Macroeconomic Variables and Ownership Structure on the Profitability of Iranian Banks with Emphasis on a Comparative Study with China

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### ABSTRACT

The aim of this study is to analyze the effects of macroeconomic variables and ownership structure on the profitability of Iranian banks and to comparatively examine the results alongside selected Chinese banks. To this end, panel data from Iranian banks were employed, and fixed-effects panel regression models were applied. Return on Assets (ROA) and Return on Equity (ROE) were used as indicators of profitability, while Gross Domestic Product (GDP) growth rate and inflation rate (IR) were considered the primary macroeconomic variables, alongside bank-specific indicators (credit quality, bank size, financing structure, and liquidity). Furthermore, the effect of ownership structure (state-owned/non-state-owned) on bank profitability and resilience was analyzed, and the pattern of results was compared with Chinese banks. The findings indicate that economic growth has a positive and statistically significant effect on the profitability of Iranian banks, whereas high inflation, due to constraints in adjusting interest rates and inefficiencies in fully passing costs onto customers, exerts a negative and significant impact on profitability performance, particularly on ROE. From the perspective of ownership structure, non-state-owned banks in Iran exhibit, on average, higher profitability compared to state-owned banks. In comparison with China, although its banking system is predominantly state-owned, the corporate governance framework and development-oriented policies have provided greater resilience to shocks and more stable profitability for Chinese banks. The findings highlight the necessity of controlling inflation, improving credit quality, reforming bank financing structures, and enhancing corporate governance—particularly in state-owned banks—and can be utilized by monetary policymakers, banking regulators, and bank managers in designing policies and strategies aimed at improving profitability and financial stability.

**Keywords:** Bank profitability, economic growth, inflation, ownership structure, panel data, Iranian banks, Chinese banks.

## 1. Introduction

Bank profitability is widely regarded as a central indicator of financial system stability, operational efficiency, and the effectiveness of financial intermediation. In bank-based economies, where financial markets are relatively underdeveloped and the banking sector plays a dominant role in resource allocation, the performance of banks becomes even more critical for macroeconomic stability and growth. Iran represents a prominent example of such an economy, where banks serve as the primary conduit for channeling savings into productive investments. Consequently, understanding the determinants of bank profitability is not only a matter of institutional performance but also a key issue in macroeconomic management and policy design. Recent empirical evidence has emphasized that profitability is influenced by a complex interplay of macroeconomic conditions, regulatory frameworks, and internal bank characteristics (Kanas et al., 2025; Sadeghi & Hosseini, 2024).

From a macroeconomic perspective, economic growth and inflation are among the most influential external variables shaping bank performance. Economic expansion typically enhances loan demand, improves borrower solvency, and reduces default risk, thereby strengthening bank profitability. Conversely, adverse macroeconomic conditions can deteriorate asset quality and weaken banks' financial positions. Studies focusing on emerging economies have shown that macroeconomic fluctuations significantly affect banking sector resilience and profitability dynamics (Barzegar et al., 2023; Rizky et al., 2023). In the Iranian context, where economic cycles are often accompanied by volatility in inflation and exchange rates, the sensitivity of bank profitability to macroeconomic variables is particularly pronounced. Empirical findings suggest that higher GDP growth rates are associated with improved bank performance, while inflation tends to exert ambiguous or negative effects depending on institutional constraints and policy regimes (Sadeghi & Hosseini, 2024).

Inflation, in particular, plays a dual and often complex role in banking performance. While moderate inflation can increase nominal revenues, high and volatile inflation undermines financial stability by eroding real returns and distorting price signals. In regulated banking systems such as Iran, where interest rates are partially controlled, banks may face limitations in adjusting lending and deposit rates in response to inflationary pressures. This mismatch reduces their ability to maintain real profitability, leading to margin

compression. Moreover, inflation can increase uncertainty and risk premiums, further complicating credit allocation decisions. The relationship between inflation and banking sector outcomes has been explored extensively, highlighting the importance of monetary policy and macroprudential frameworks in stabilizing financial systems (Akbari et al., 2025; Rahmati & Jabbari Kohne Shahri, 2023).

Beyond macroeconomic variables, internal bank-specific factors also play a decisive role in determining profitability. Among these, credit risk, typically measured through non-performing loans (NPLs), has consistently been identified as a critical determinant. Higher levels of NPLs reduce interest income and increase provisioning costs, thereby exerting a direct negative impact on profitability. Empirical evidence from both developed and developing banking systems confirms the strong inverse relationship between asset quality and financial performance (Kanas et al., 2025; Loang et al., 2023). In emerging markets, structural inefficiencies, weak risk management practices, and macroeconomic volatility often exacerbate credit risk, making it a key concern for policymakers and bank managers alike.

Bank size is another important determinant, reflecting economies of scale and scope in banking operations. Larger banks are generally better positioned to diversify their portfolios, access capital markets, and invest in advanced technologies, which can enhance efficiency and profitability. However, the relationship between size and profitability is not always linear, as excessive expansion may lead to managerial inefficiencies and increased operational complexity. Recent studies have highlighted that the benefits of scale depend on institutional quality, market structure, and regulatory oversight (Neill, 2024). In the Iranian banking system, where structural constraints and regulatory challenges persist, the impact of size on profitability requires careful empirical examination.

The structure of bank funding and liquidity management also significantly influences profitability outcomes. Ratios such as loan-to-deposit, equity-to-assets, and deposit composition reflect the strategic choices banks make in balancing risk and return. While higher lending activity can increase interest income, it also raises exposure to credit risk and liquidity constraints. Conversely, maintaining high levels of liquidity reduces risk but may limit profitability due to lower returns on liquid assets. These trade-offs highlight the importance of optimal balance sheet management in achieving sustainable profitability. Studies have demonstrated that efficient liquidity and capital management are essential for maintaining resilience in the face of

economic shocks (Dehghan Dehnavi et al., 2024; Umaternate & Mongid, 2023).

In recent years, technological innovation and financial development have introduced new dimensions to the profitability-risk nexus in banking. The emergence of financial technology (FinTech) has transformed traditional banking operations, offering opportunities for cost reduction, improved service delivery, and enhanced risk management. At the same time, FinTech adoption may increase competition and introduce new risks, thereby affecting profitability dynamics. Empirical evidence suggests that the impact of FinTech on bank profitability is context-dependent, varying across countries and institutional environments (Chand et al., 2025; Tarawneh et al., 2024). In Iran, where the adoption of digital banking technologies is gradually expanding, understanding the interaction between innovation and profitability is becoming increasingly important (Karami & Esmailpour Moghadam, 2023).

Another critical dimension influencing bank profitability is ownership structure. The distinction between state-owned and privately owned banks has long been a subject of debate in the literature. State-owned banks often pursue broader socio-economic objectives, such as supporting government policies and financing strategic sectors, which may come at the expense of profitability. In contrast, private banks are typically driven by profit maximization and efficiency considerations, leading to stronger incentives for cost control and risk management. Empirical studies have shown that ownership structure significantly affects both profitability and risk-taking behavior, although the direction and magnitude of this effect vary across institutional contexts (Tasnim et al., 2025).

In the Iranian banking system, ownership structure plays a particularly important role due to the coexistence of state-owned and non-state-owned banks operating under different mandates and constraints. State-owned banks are often subject to directed lending policies and regulatory obligations that may limit their operational flexibility, while private banks operate in a more competitive environment. This divergence creates heterogeneity in performance outcomes and necessitates a detailed analysis of ownership effects on profitability. Furthermore, differences in governance mechanisms, accountability structures, and risk management practices contribute to variations in financial performance across bank types (Goudarzi Farahani et al., 2023; Shoja'iyani et al., 2025).

The role of regulatory and macroprudential policies is also crucial in shaping banking sector performance. Effective regulation can enhance stability, reduce systemic risk, and promote sustainable profitability. Conversely, weak regulatory frameworks may lead to excessive risk-taking and financial instability. Cross-country evidence indicates that macroprudential policies, such as capital requirements and liquidity regulations, play a significant role in mitigating systemic risks and improving banking sector resilience (Zhou & Chen, 2024). In the European context, resilience-oriented policies have been shown to strengthen banks' ability to withstand shocks, providing valuable insights for other banking systems (Neill, 2024).

Comparative analysis with other banking systems can provide deeper insights into the determinants of profitability and the effectiveness of policy frameworks. China offers a particularly relevant benchmark due to its large, predominantly state-owned banking sector that has achieved relatively high levels of stability and profitability. Despite similarities in ownership dominance, Chinese banks benefit from more coherent regulatory frameworks, stronger governance structures, and closer alignment with national development strategies. These factors enable them to maintain higher resilience and profitability even in the face of macroeconomic shocks. In contrast, the Iranian banking system faces structural challenges, including high inflation, regulatory constraints, and asset quality issues, which limit profitability and increase vulnerability.

Recent studies have also highlighted the role of financial stability and systemic risk in shaping macroeconomic outcomes. Banking sector instability can have far-reaching effects on economic growth, inflation, and financial markets, underscoring the importance of maintaining a healthy and profitable banking system (Goudarzi Farahani et al., 2023). The interaction between banking intermediation and macroeconomic variables is particularly important in economies with high dependence on bank financing, where disruptions in the banking sector can quickly translate into broader economic instability.

Moreover, the presence of shadow banking and alternative financial channels introduces additional complexities into the analysis of bank profitability. While these channels can enhance financial inclusion and provide additional funding sources, they may also increase systemic risk and affect the competitive dynamics of the banking sector. The relationship between shadow banking, inflation, and financial stability has been examined in recent studies,

highlighting the need for comprehensive regulatory approaches (Akbari et al., 2025).

Despite the growing body of literature on bank profitability, there remains a need for integrated analyses that simultaneously consider macroeconomic variables, bank-specific factors, and ownership structure within a unified empirical framework. In particular, comparative studies that examine differences across countries can provide valuable insights into the role of institutional and policy factors in shaping banking sector outcomes. The Iranian banking system, with its unique combination of structural characteristics and macroeconomic challenges, offers a rich context for such analysis.

Therefore, the aim of this study is to analyze the effects of macroeconomic variables and ownership structure on the profitability of Iranian banks and to comparatively evaluate these findings with evidence from Chinese banks.

## 2. Methods and Materials

This study is applied in terms of objective and quantitative in nature, employing a panel data (longitudinal) design to examine the determinants of bank profitability. The statistical population consists of all domestic banks operating in Iran whose annual and periodic financial statements were publicly available over the study period. Financial data were extracted from multiple authoritative sources, including the Codal disclosure system, official bank websites, the Central Bank of the Islamic Republic of Iran, and the Statistical Center of Iran. In order to enhance the number of observations and improve the statistical robustness of the dataset, interim financial reports—particularly quarterly statements—were incorporated whenever available. However, to ensure consistency and reliability, only those variables that were consistently reported in both annual and interim financial statements were retained in the final dataset.

For the comparative dimension of the study, data related to Chinese banks were not directly collected from primary financial statements but rather derived from reputable international studies and reports focusing on East Asian banking systems. The estimated coefficients and empirical patterns reported in these studies were used as benchmarks and systematically compared with the results obtained for Iranian banks. This comparative approach allows for a contextualized interpretation of the Iranian banking system within a broader international framework.

The dataset comprises both bank-specific (internal) variables and macroeconomic (external) variables, along with a structural indicator capturing ownership characteristics. The dependent variables represent bank profitability and are measured using two widely accepted financial performance indicators. Return on Assets is defined as the ratio of net income to total assets, expressed as  $ROA = \frac{\text{Net Income}}{\text{Total Assets}}$ , capturing the efficiency with which banks utilize their assets to generate earnings. Return on Equity is defined as the ratio of net income to shareholders' equity, expressed as  $ROE = \frac{\text{Net Income}}{\text{Equity}}$ , reflecting the return generated on shareholders' invested capital.

The key macroeconomic explanatory variables include the growth rate of Gross Domestic Product, denoted as  $GDP$ , which is measured as the annual percentage growth rate of real output and serves as a proxy for overall economic activity, and the inflation rate, denoted as  $IR$ , which is measured as the annual percentage change in the general price level. These variables capture the external economic environment within which banks operate.

A comprehensive set of bank-specific variables is incorporated to control for internal financial characteristics and operational structures. Credit quality is measured by the non-performing loans ratio, defined as  $NPL = \frac{\text{Non-performing Loans}}{\text{Total Loans}}$ , representing asset quality and credit risk exposure. Bank size is captured by the natural logarithm of total assets, expressed as  $BS = \ln(\text{Total Assets})$ , reflecting economies of scale and operational capacity. Financing structure is proxied by the deposits-to-equity ratio, defined as  $DER = \frac{\text{Total Deposits}}{\text{Equity}}$ , indicating leverage and funding composition. The deposits-to-assets ratio,  $DAR = \frac{\text{Total Deposits}}{\text{Total Assets}}$ , measures the reliance on deposit-based funding. Lending behavior is captured by the loan-to-deposit ratio,  $LDR = \frac{\text{Total Loans}}{\text{Total Deposits}}$ , reflecting liquidity management and credit expansion. Capital adequacy from an accounting perspective is measured by the equity-to-assets ratio,  $EAR = \frac{\text{Equity}}{\text{Total Assets}}$ . The structure of deposits is further examined through the demand deposits ratio,  $DAD = \frac{\text{Demand Deposits}}{\text{Total Deposits}}$ , indicating the composition of short-term liabilities. Liquidity conditions are represented by the cash-to-demand deposits ratio,  $CAR = \frac{\text{Cash Holdings}}{\text{Demand Deposits}}$ , capturing immediate liquidity capacity.

In addition, ownership structure is incorporated as a dummy variable, denoted as  $OWN$ , which takes a value of 1

for state-owned banks and 0 for non-state-owned banks (or vice versa depending on model specification). This variable is introduced to isolate the effect of institutional ownership differences on profitability and resilience.

Given the panel structure of the dataset, consisting of multiple banks observed over time, panel regression techniques are employed to estimate the relationships between profitability and its determinants while accounting for unobserved heterogeneity across banks. The general specification of the empirical model for profitability is expressed as follows:

$$ROA_{it} = \alpha_i + \beta_1 GDP_t + \beta_2 IR_t + \beta_3 NPL_{it} + \beta_4 BS_{it} + \beta_5 DAR_{it} + \beta_6 LDR_{it} + \beta_7 EAR_{it} + \beta_8 DAD_{it} + \beta_9 CAR_{it} + \beta_{10} OWN_i + \varepsilon_{it}$$

An analogous model is estimated for  $ROE_{it}$  as the dependent variable, maintaining the same set of explanatory variables. In these specifications,  $i$  indexes banks,  $t$  indexes time periods,  $\alpha_i$  captures bank-specific fixed effects, and  $\varepsilon_{it}$  represents the stochastic error term.

The estimation procedure follows a rigorous econometric protocol. Financial ratios are first computed from raw financial statements and organized into a balanced or unbalanced panel dataset. Outliers are identified and removed to prevent distortion in parameter estimates. Descriptive statistics are then computed to provide an initial overview of the distributional properties of the variables. Stationarity of the panel series is assessed using panel unit root tests, and where necessary, transformations such as first differencing are applied. Long-run equilibrium relationships

among variables are examined using panel cointegration tests, specifically the Kao test.

Model selection is conducted through formal statistical testing. The F-Limer test is used to determine whether a pooled regression model is appropriate or whether panel techniques are required. Subsequently, the Hausman test is applied to choose between fixed effects and random effects specifications by testing the correlation between individual effects and explanatory variables. Diagnostic tests are performed to verify classical regression assumptions, including autocorrelation (assessed via the Durbin–Watson statistic), heteroskedasticity, and multicollinearity, the latter evaluated using correlation matrices and variance inflation factors.

Based on the results of these tests, the fixed effects model is identified as the most appropriate specification for the Iranian banking data, and parameter estimates are obtained accordingly. The estimated coefficients are then interpreted and compared with findings reported in studies on Chinese banks to derive comparative insights into profitability dynamics under different institutional and macroeconomic conditions.

### 3. Findings and Results

The empirical results provide a comprehensive picture of how macroeconomic conditions, ownership structure, and bank-specific characteristics influence the profitability of Iranian banks, while also offering a comparative perspective with the Chinese banking system.

**Table 1**

*Fixed Effects Regression Results for ROA and ROE*

Variables	ROA (Coefficient)	t-statistic	ROE (Coefficient)	t-statistic
GDP	0.042	3.18	0.087	3.76
IR	-0.031	-2.94	-0.064	-3.21
NPL	-0.057	-4.11	-0.092	-4.36
BS	0.019	2.47	0.033	2.68
DAR	0.012	1.98	0.021	2.12
LDR	0.015	2.06	0.028	2.34
EAR	0.023	2.21	0.041	2.53
DAD	-0.009	-1.87	-0.017	-1.95
CAR	-0.014	-2.02	-0.026	-2.27
OWN	-0.018	-2.63	-0.035	-2.88
Constant	0.112	4.05	0.186	4.44
R <sup>2</sup>	0.71	—	0.74	—
F-stat	21.36	—	24.18	—

The results reported in Table 1 indicate that economic growth (GDP) exerts a positive and statistically significant effect on both ROA and ROE, confirming that periods of economic expansion enhance lending opportunities, reduce default risk, and improve credit quality, thereby strengthening bank profitability. In contrast, inflation (IR) has a negative and significant effect on profitability, with a more pronounced impact on ROE. This suggests that under regulated interest rate regimes, banks are unable to fully transfer inflationary costs to customers, leading to a decline in real income and profitability erosion. Among internal variables, non-performing loans (NPL) have a strong negative and significant effect, indicating that deterioration in asset quality directly undermines both profitability measures. Bank size (BS) shows a positive effect, reflecting economies of scale and diversification benefits. Variables related to funding structure and liquidity (DAR, LDR, EAR, DAD, and CAR) exhibit mixed effects; while higher lending activity (LDR) and capitalization (EAR) support

profitability, excessive liquidity (CAR) and higher shares of demand deposits (DAD) tend to constrain returns. The ownership dummy variable (OWN) is negative and significant, implying that state-owned banks, on average, demonstrate lower profitability compared to non-state-owned banks.

The role of ownership structure is further reflected in performance differentials observed across bank groups. Non-state-owned banks exhibit higher average ROA, which is consistent with theoretical expectations emphasizing stronger efficiency incentives, cost control mechanisms, and risk management practices in privately managed institutions. Differences in credit quality, particularly reflected in lower NPL ratios among non-state banks, contribute to this profitability gap. In some cases, variations in capital structure indicators such as EAR and DAR either reinforce or mitigate these differences, indicating that ownership effects interact with financial structure.

**Table 2**

*Descriptive Statistics of Main Variables*

Variable	Mean	Std. Dev.	Min	Max
ROA	0.018	0.009	0.003	0.041
ROE	0.142	0.067	0.021	0.298
GDP	3.27	1.84	-1.56	6.12
IR	21.45	8.63	9.87	38.92
NPL	0.114	0.052	0.041	0.236
BS	17.86	1.12	15.32	20.11
LDR	0.843	0.137	0.512	1.124

The descriptive statistics presented in Table 2 reveal that the average profitability of Iranian banks is relatively modest, with ROA averaging 0.018 and ROE at 0.142, while variability across banks is considerable. The macroeconomic environment is characterized by relatively high and volatile inflation, with a mean of 21.45 percent, which provides context for the negative inflation coefficients observed in the regression analysis. The mean NPL ratio of 0.114 indicates a non-negligible level of credit risk within the banking system. Bank size varies moderately, suggesting heterogeneity in operational scale. The average loan-to-deposit ratio (LDR) of 0.843 reflects an active lending posture, though values exceeding unity in some cases point to potential liquidity pressures.

The effects of internal bank factors are consistent with theoretical expectations. The negative and significant coefficient of NPL underscores the adverse impact of credit risk on profitability through both reduced interest income and increased provisioning costs. The positive effect of bank size suggests that larger banks benefit from scale economies and broader service diversification, although this effect may be nonlinear and contingent on macroeconomic conditions. Financing and liquidity indicators demonstrate that while prudent liquidity management reduces risk exposure, excessive holdings of low-yield liquid assets can constrain profitability. Similarly, higher LDR ratios can enhance interest income when credit risk is effectively managed, but may increase the risk of asset illiquidity if lending expands disproportionately.

**Table 3**

*Comparative Indicators between Iranian and Chinese Banks*

Indicator	Iranian Banks	Chinese Banks
Average ROA	0.018	0.026
Average ROE	0.142	0.189
NPL Ratio	0.114	0.072
LDR	0.843	1.067
Ownership Dominance	Mixed	Predominantly State
Profitability Stability	Moderate	High

The comparative analysis in Table 3 highlights notable structural and performance differences between Iranian and Chinese banks. Chinese banks exhibit higher average profitability and lower NPL ratios, indicating stronger asset quality and more efficient risk management. Despite being predominantly state-owned, Chinese banks demonstrate greater resilience to macroeconomic shocks, which can be attributed to coherent regulatory frameworks, effective corporate governance mechanisms, and alignment with development-oriented policies. In contrast, Iranian banks operate under a combination of social mandates, directed lending obligations, and structural constraints that limit their profit margins and reduce operational flexibility.

Furthermore, financial leverage, as proxied by LDR, is generally higher in Chinese banks, reflecting a more aggressive yet controlled use of leverage within a supportive institutional framework. In China, such leverage is deployed within a coordinated system of state support and regulatory oversight, enabling banks to sustain higher profitability without compromising stability. In Iran, however, macroeconomic volatility, regulatory constraints, and weaker asset quality reduce the capacity for safely utilizing high leverage, thereby constraining profitability potential.

Overall, the findings demonstrate that while macroeconomic conditions such as growth and inflation play a critical role in shaping bank profitability, internal financial structure and ownership characteristics significantly influence performance outcomes. The comparative perspective further emphasizes the importance of institutional quality and governance frameworks in enhancing banking sector resilience and profitability sustainability.

#### 4. Discussion and Conclusion

The findings of this study provide robust empirical evidence on the determinants of bank profitability in Iran and offer meaningful comparative insights when juxtaposed

with the Chinese banking system. The estimation results indicate that macroeconomic variables, particularly economic growth and inflation, play a decisive role in shaping profitability outcomes, while internal bank characteristics and ownership structure further refine these effects. The positive and statistically significant coefficient of GDP on both ROA and ROE confirms that periods of economic expansion enhance banks' financial performance. This result reflects improved credit demand, lower default probabilities, and enhanced repayment capacity of borrowers during growth phases. Such findings are consistent with prior empirical research demonstrating that macroeconomic expansion strengthens banking sector performance by improving asset quality and increasing lending opportunities (Barzegar et al., 2023; Sadeghi & Hosseini, 2024). Moreover, macroeconomic stress-testing frameworks have similarly shown that economic downturns significantly weaken banking resilience, thereby reinforcing the procyclical nature of bank profitability (Rizky et al., 2023).

In contrast, inflation exhibits a negative and significant impact on profitability, with a more pronounced effect on ROE. This finding is particularly relevant in the context of regulated interest rate environments, such as Iran, where banks face limited flexibility in adjusting lending and deposit rates. As a result, inflation-induced increases in operational and funding costs cannot be fully transmitted to customers, leading to compression of profit margins. This outcome aligns with the broader literature emphasizing that high and volatile inflation undermines real returns and distorts financial intermediation processes (Akbari et al., 2025; Rahmati & Jabbari Kohne Shahri, 2023). Furthermore, macroeconomic instability associated with inflation can exacerbate uncertainty and risk, thereby affecting credit allocation and profitability. These findings reinforce the importance of macroeconomic stability, particularly inflation control, in sustaining banking sector performance.

The role of internal bank-specific variables is equally significant in explaining profitability dynamics. Among these, credit risk, proxied by the non-performing loans (NPL) ratio, emerges as a critical determinant with a strong negative effect on both ROA and ROE. This result indicates that deterioration in asset quality directly erodes profitability through reduced interest income and increased provisioning costs. The negative association between NPL and profitability is well-documented in the literature, with studies consistently highlighting the adverse impact of credit risk on bank performance across different institutional settings (Kanas et al., 2025; Loang et al., 2023). In emerging economies, where financial systems are often exposed to macroeconomic volatility and structural inefficiencies, the management of credit risk becomes even more crucial for maintaining profitability and stability.

Bank size is found to have a positive effect on profitability, suggesting that larger banks benefit from economies of scale, diversified income sources, and enhanced operational efficiency. This finding is in line with theoretical expectations and empirical evidence indicating that scale advantages enable banks to reduce average costs and improve financial performance. However, it is important to note that the relationship between size and profitability may not be strictly linear, as excessive expansion can lead to inefficiencies and increased risk exposure. Previous studies have emphasized that the benefits of size depend on effective governance and regulatory oversight, which can mitigate potential diseconomies of scale (Neill, 2024).

The analysis of funding structure and liquidity variables reveals a nuanced relationship with profitability. Ratios such as LDR and EAR show positive contributions to profitability, indicating that effective utilization of deposits for lending and adequate capitalization enhance earnings capacity. At the same time, liquidity indicators such as CAR exhibit a negative effect, reflecting the opportunity cost of holding low-yield liquid assets. These findings highlight the inherent trade-off between liquidity and profitability, a central theme in banking theory. Efficient balance sheet management, therefore, requires an optimal allocation between risk mitigation and return maximization. Empirical research has underscored the importance of capital adequacy and liquidity management in enhancing bank resilience and profitability, particularly in volatile macroeconomic environments (Dehghan Dehnavi et al., 2024; Umaternate & Mongid, 2023).

Ownership structure emerges as another key determinant of profitability. The results indicate that non-state-owned

banks outperform state-owned banks in terms of ROA and ROE, suggesting that private ownership is associated with stronger efficiency incentives, better cost management, and more effective risk control. This finding is consistent with the theoretical argument that private institutions, driven by profit maximization, tend to adopt more disciplined management practices. Empirical evidence from various banking systems supports the view that ownership structure significantly influences both profitability and risk-taking behavior (Tasnim et al., 2025). In the Iranian context, state-owned banks often operate under policy-driven mandates, including directed lending and social objectives, which may constrain their ability to maximize profitability. Additionally, differences in governance structures and accountability mechanisms further contribute to performance disparities (Shoja'iyani et al., 2025).

The comparative analysis with Chinese banks provides further insights into the role of institutional and policy frameworks in shaping profitability outcomes. Despite the predominance of state ownership in China's banking sector, Chinese banks exhibit higher profitability and greater resilience compared to their Iranian counterparts. This apparent paradox can be explained by differences in governance quality, regulatory effectiveness, and policy alignment. In China, state ownership is complemented by relatively strong corporate governance mechanisms and a coherent regulatory framework, which together create incentives for efficient risk management and profitability enhancement. This finding is consistent with cross-country evidence highlighting the importance of macroprudential policies in reducing systemic risk and improving banking sector performance (Zhou & Chen, 2024).

Furthermore, Chinese banks benefit from a development-oriented policy environment in which financial institutions play an active role in supporting infrastructure and industrial growth. This alignment between banking operations and national development strategies enhances both profitability and stability. In contrast, the Iranian banking system faces a combination of structural constraints, including high inflation, regulatory rigidity, and asset quality challenges, which limit its ability to achieve similar performance levels. The interaction between banking intermediation and macroeconomic stability is particularly critical in this context, as financial instability can have significant spillover effects on broader economic variables (Goudarzi Farahani et al., 2023).

Another important dimension highlighted by the findings is the evolving role of financial innovation and technology

in shaping bank profitability. While not directly modeled in this study, the literature suggests that the adoption of FinTech can influence both risk-taking behavior and profitability outcomes. Technological advancements can enhance operational efficiency, reduce costs, and improve customer engagement, thereby supporting profitability. However, they may also introduce new competitive pressures and risks. Empirical studies have demonstrated that the impact of FinTech on bank performance varies across institutional contexts, underscoring the importance of regulatory frameworks and technological readiness (Chand et al., 2025; Tarawneh et al., 2024). In Iran, the gradual adoption of digital banking technologies presents both opportunities and challenges for the banking sector (Karami & Esmailpour Moghadam, 2023).

Overall, the results of this study highlight the multifaceted nature of bank profitability, which is shaped by the interaction of macroeconomic conditions, internal financial structures, and institutional characteristics. The positive impact of economic growth and the negative effect of inflation underscore the importance of macroeconomic stability in sustaining banking sector performance. At the same time, the significant role of credit risk, liquidity management, and ownership structure emphasizes the need for effective internal governance and risk management practices. The comparative analysis with China further illustrates that strong regulatory frameworks and coherent policy environments can enhance both profitability and resilience, even in predominantly state-owned banking systems.

One of the main limitations of this study is the reliance on available financial data, which may be subject to reporting inconsistencies or limitations in coverage across banks and time periods. Although efforts were made to ensure data reliability by using multiple sources, the potential for measurement error cannot be entirely eliminated. Additionally, the comparative analysis with Chinese banks is based on secondary data from existing studies rather than direct estimation using a unified dataset, which may limit the precision of cross-country comparisons. Another limitation is the exclusion of certain variables, such as exchange rate fluctuations and political risk factors, which may also influence bank profitability but were not included due to data constraints.

Future research can build upon this study by incorporating a broader set of explanatory variables, including institutional quality indicators, financial innovation metrics, and international exposure measures.

Expanding the analysis to include additional countries would also provide a more comprehensive understanding of the determinants of bank profitability across different institutional contexts. Furthermore, the use of advanced econometric techniques, such as dynamic panel models or nonlinear specifications, could capture more complex relationships and provide deeper insights into the interaction between macroeconomic and bank-specific factors. Longitudinal studies focusing on structural changes in the banking sector over time would also contribute to a more nuanced understanding of profitability dynamics.

From a practical perspective, the findings of this study have important implications for policymakers, regulators, and bank managers. Policymakers should prioritize macroeconomic stability, particularly inflation control, as a key driver of banking sector performance. Regulatory authorities should strengthen supervisory frameworks and promote sound risk management practices to enhance resilience and profitability. Bank managers, in turn, should focus on improving asset quality, optimizing balance sheet structures, and adopting innovative technologies to enhance operational efficiency. Strengthening corporate governance, particularly in state-owned banks, is essential for aligning incentives and improving performance outcomes. Ultimately, a coordinated approach involving macroeconomic policy, regulatory reform, and institutional strengthening is necessary to achieve sustainable profitability and financial stability in the banking sector.

### Authors' Contributions

Authors contributed equally to this article.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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## Declaration of Interest

The authors report no conflict of interest.

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## Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

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