



Research Article

The impact of competitive strategies and market concentration on earnings smoothing in the banking sector: Evidence from 10 Iranian Banks

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ABSTRACT

Purpose- This study aims to examine the impact of competitive strategies and market concentration on earnings smoothing behavior in the Iranian banking sector, addressing a gap in the literature by simultaneously investigating the effects of banking competition and market concentration on earnings smoothing within an emerging market context.

Design/methodology/approach- The study uses panel data from 10 banks listed on the Tehran Stock Exchange over the period 2014–2023. The dynamic panel Generalized Method of Moments (GMM) estimator is applied to control for endogeneity, autocorrelation, and unobserved heterogeneity. Earnings smoothing is measured using loan loss provisions, banking competition is captured through the Panzar–Rosse H-statistic, and market concentration is measured by the asset share of the five largest banks.

Findings- The empirical results reveal that both banking competition and market concentration have a positive and significant effect on earnings smoothing behavior. Banks operating in highly competitive and concentrated markets tend to stabilize reported earnings in order to preserve investor confidence, reduce perceived financial risk, and maintain market reputation. However, the moderating role of earnings before provisions and taxes is found to be statistically insignificant.

Originality/value- This study contributes to the literature on banking behavior, earnings management, and industrial organization by providing novel empirical evidence from the Iranian banking industry as a representative emerging banking system. The findings also offer practical implications for regulators and policymakers seeking to enhance financial transparency, supervisory monitoring, and governance quality in banking institutions.

Keywords: Competition Strategy, Concentration, Earnings Smoothing, Bank

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Abstrak

Tujuan - Penelitian ini bertujuan untuk mengkaji pengaruh strategi kompetitif dan konsentrasi pasar terhadap perilaku perataan laba (*earnings smoothing*) pada sektor perbankan Iran. Studi ini mengisi kesenjangan penting dalam literatur perbankan dengan mengkaji secara simultan pengaruh persaingan perbankan dan konsentrasi pasar terhadap perataan laba dalam konteks pasar negara berkembang.

Desain/metodologi/pendekatan - Penelitian ini menggunakan data panel dari 10 bank yang terdaftar di Bursa Efek Teheran (Tehran Stock Exchange) selama periode 2014–2023. Estimator *dynamic panel Generalized Method of Moments* (GMM) digunakan untuk mengendalikan masalah endogenitas, autokorelasi, dan heterogenitas yang tidak teramati. Perataan laba diukur menggunakan cadangan kerugian kredit (*loan loss provisions*), persaingan perbankan diukur melalui *Panzar–Rosse H-statistic*, dan konsentrasi pasar diukur berdasarkan pangsa aset lima bank terbesar.

Temuan - Hasil empiris menunjukkan bahwa persaingan perbankan dan konsentrasi pasar berpengaruh positif dan signifikan terhadap perilaku perataan laba. Bank yang beroperasi pada pasar dengan tingkat persaingan dan konsentrasi tinggi cenderung menstabilkan laba yang dilaporkan guna menjaga kepercayaan investor, mengurangi persepsi risiko keuangan, serta mempertahankan reputasi pasar. Namun demikian, peran moderasi dari laba sebelum cadangan kerugian dan pajak (*earnings before provisions and taxes*) tidak signifikan secara statistik.

Orisinalitas/nilai - Penelitian ini memberikan kontribusi terhadap literatur perilaku perbankan, manajemen laba, dan organisasi industri dengan menyajikan bukti empiris baru dari industri perbankan Iran sebagai representasi sistem perbankan negara berkembang. Temuan ini juga memberikan implikasi praktis bagi regulator dan pembuat kebijakan dalam upaya meningkatkan transparansi keuangan, pengawasan, dan kualitas tata kelola pada institusi perbankan.

Kata Kunci: Strategi Kompetisi, Konsentrasi, Perataan Laba, Bank.

1. Introduction

Banks play a central role in economic development by facilitating capital allocation, financial intermediation, and investment activities. As the primary financial institutions within modern economies, banks contribute significantly to economic growth through the efficient distribution of financial resources and the provision of credit services. Moreover, the stability and performance of the banking sector are essential for maintaining confidence in financial markets and supporting sustainable economic development (Rajan & Zingales, 1998).

In recent decades, earnings smoothing has become an important issue in financial reporting and banking research. Earnings smoothing refers to managerial efforts to reduce fluctuations in reported earnings in order to present a more stable and predictable pattern of financial performance over time (Beidleman, 1973). Since banks operate in highly regulated and risk-sensitive environments, stable earnings may be perceived by investors, depositors, and regulators as indicators of lower risk and stronger financial health. Consequently, bank managers may have incentives to smooth earnings to maintain market confidence, reduce perceived financial risk, and improve relationships with stakeholders (Fudenberg & Tirole, 1995; Graham et al., 2005). However, earnings smoothing may also raise concerns regarding the transparency and reliability of financial reporting when managerial discretion is used opportunistically.

Prior literature suggests that earnings smoothing behavior in banks is influenced by both internal managerial incentives and external market conditions. Among external factors, banking

competition and market concentration are particularly relevant because they shape banks' profitability, market power, strategic behavior, and managerial incentives. Competitive banking environments may place pressure on profit margins through changes in lending and deposit rates, potentially increasing managerial incentives to stabilize reported earnings and preserve investor confidence (Boot & Thakor, 2000). In contrast, market concentration may provide banks with greater market power and pricing flexibility, which can affect profitability stability and managerial reporting decisions (Saunders & Schumacher, 2000). Therefore, understanding how competition and concentration influence earnings smoothing is important for explaining the financial reporting behavior of banks.

The relationship between competition, concentration, and earnings smoothing has received increasing attention in the literature. Ozili and Outa (2018) found that ownership structure, economic conditions, and regulatory environments significantly influence income-smoothing behavior in South African banks. Peterson and Arun (2018) reported that income-smoothing practices differ across European banks according to bank characteristics and economic conditions. Olszak and Kowalska (2023) further demonstrated that banking competition and market structure significantly affect the sensitivity of bank profitability to business cycles. More recently, Shala et al. (2024) examined the relationship between competition, concentration, and bank income smoothing in Central and Eastern European countries, providing further evidence that market structure is relevant to banks' financial reporting behavior. Nevertheless, empirical findings across different institutional settings remain inconclusive, suggesting that the relationship between market conditions and earnings smoothing may depend on the characteristics of the banking system.

Despite the growing literature, several important research gaps remain. First, previous studies have predominantly examined banking competition and market concentration separately, resulting in limited evidence regarding their simultaneous effects on bank earnings smoothing. Examining these two market-structure dimensions within a single framework is important because competition and concentration represent related but distinct characteristics of the banking environment. Second, relatively limited empirical evidence is available from emerging banking markets, particularly those characterized by regulatory intervention, ownership concentration, and relatively limited financial transparency. Such institutional characteristics may generate managerial incentives that differ from those observed in developed banking systems. Third, although loan loss provisions are widely recognized as an important component of bank earnings and a potential mechanism for earnings management, limited research has examined whether the relationship between pre-tax profit and loan loss provisions changes the effects of banking competition and market concentration on earnings smoothing. The pre-tax profit to loan loss provision ratio may influence managerial incentives because changes in profitability and provisioning decisions can affect the extent to which managers attempt to stabilize reported earnings.

These gaps are particularly relevant in the Iranian banking sector. The Iranian banking system operates within a distinctive institutional environment characterized by substantial regulatory involvement, varying ownership structures, and market-structure conditions that may influence managerial reporting behavior. Consequently, evidence from developed economies or other emerging markets may not necessarily be generalizable to Iranian banks. Investigating the relationship between banking competition, market concentration, and earnings smoothing in this context can therefore provide additional evidence regarding the role of institutional and market conditions in shaping bank financial reporting behavior.

Accordingly, this study examines the effects of banking competition and market concentration on earnings smoothing in the Iranian banking sector using panel data from banks listed on the Tehran Stock Exchange during the period 2014–2023. In addition, the study examines whether the pre-tax profit to loan loss provision ratio moderates the relationships between banking competition, market concentration, and earnings smoothing. To address the dynamic nature of bank earnings behavior and potential endogeneity among the variables, the study employs a dynamic panel Generalized Method of Moments (GMM) estimator.

This study contributes to the literature in several ways. First, it simultaneously examines banking competition and market concentration as determinants of bank earnings smoothing, thereby providing a more comprehensive perspective on the role of market structure in financial reporting behavior. Second, it extends the literature by examining the moderating role of the pre-tax profit to loan loss provision ratio, which has received limited attention in previous earnings-smoothing research. Third, the study provides empirical evidence from the Iranian banking sector, thereby extending the geographical and institutional scope of the existing literature. Finally, by integrating perspectives from earnings-smoothing theory and banking market structure, this study provides insights into how external competitive conditions and bank-specific provisioning characteristics jointly shape managerial financial reporting behavior. The findings may have implications for banking regulators, policymakers, and financial managers seeking to strengthen financial reporting transparency and banking stability.

2. Theoretical Background and Hypothesis Development

Earnings Smoothing

Earnings smoothing refers to managerial efforts to reduce fluctuations in reported earnings over time in order to present a more stable and predictable pattern of financial performance. Earnings smoothing may arise from legitimate managerial efforts to communicate information about expected future performance; however, it may also reflect opportunistic managerial behavior when accounting discretion is used to influence reported earnings. Therefore, earnings smoothing remains an important issue in financial reporting because it may affect the transparency, reliability, and quality of accounting information.

The theoretical foundation of earnings smoothing can be traced to Beidleman (1973), who argued that managers have incentives to reduce fluctuations in reported earnings because excessive earnings volatility creates uncertainty among investors and financial analysts. By presenting more stable earnings, managers may reduce perceived uncertainty and provide a more predictable picture of the firm's financial performance. Earnings smoothing may therefore serve as a mechanism through which managers manage external stakeholders' expectations.

Lambert (1984) further argued that income smoothing can represent rational managerial behavior motivated by economic incentives. Managers may attempt to stabilize reported earnings to influence market expectations, strengthen investor confidence, and improve performance-based compensation. From this perspective, managerial reporting behavior is influenced by the economic consequences associated with reported financial performance.

Fudenberg and Tirole (1995) provide another theoretical explanation by emphasizing managerial career concerns and financing conditions. Managers may smooth earnings to reduce the likelihood of adverse market reactions and protect their positions within the organization. In addition,

lower earnings volatility may reduce the perceived risk of the firm and facilitate access to external financing. Thus, earnings smoothing can be viewed as a strategic response to both internal managerial incentives and external market pressures.

These theoretical perspectives suggest that earnings smoothing is not solely determined by internal firm characteristics but may also be influenced by the external environment in which firms operate. In the banking sector, competitive pressure and market concentration are particularly important because banks operate in a highly regulated and competitive environment characterized by information asymmetry, credit risk, and substantial managerial discretion in financial reporting.

Competitive Strategy and Bank Earnings Smoothing

Competitive strategy reflects how firms respond to competitive pressure and position themselves within their respective markets. In the banking industry, competitive conditions may influence profitability, risk-taking, pricing decisions, and managerial behavior. Boot and Thakor (2000) argue that competition affects bank profitability and strategic behavior, suggesting that changes in competitive intensity may alter managerial incentives.

The relationship between competitive strategy and earnings smoothing can be explained by the theoretical arguments of Beidleman (1973), Lambert (1984), and Fudenberg and Tirole (1995). When competitive pressure increases, banks may face greater uncertainty regarding profitability and future performance. Managers may consequently have stronger incentives to reduce fluctuations in reported earnings in order to maintain investor confidence, satisfy market expectations, and reduce perceived financial risk.

Empirical evidence provides support for the relationship between competition and managerial reporting behavior. Barzegar et al. (2014) found that product market competition was positively associated with earnings management among Iranian firms, indicating that competitive pressure may encourage managers to influence reported financial performance. This finding is consistent with the argument that managers operating under greater competitive pressure may have stronger incentives to manage reported earnings.

However, the evidence is not entirely consistent. Mohammadzadeh et al. (2019) found that competitive market structures did not significantly affect real earnings management after controlling for ownership structure. This inconsistency suggests that the relationship between competition and earnings management may depend on the institutional environment, the characteristics of firms, and the specific form of earnings management examined.

Evidence from the banking sector also indicates that competitive conditions affect bank financial performance and managerial behavior. Olszak and Kowalska (2023) found that banking competition and market structure significantly affect the sensitivity of bank profitability to business cycles. Furthermore, Shala et al. (2024) demonstrated that competition is associated with bank income-smoothing behavior through loan loss provisions. These findings indicate that competitive conditions may influence managers' decisions concerning reported earnings and provisioning.

Based on the earnings-smoothing theories and empirical evidence, competitive pressure may increase managers' incentives to stabilize reported financial performance. Nevertheless, the mixed findings in previous studies indicate that this relationship requires further examination, particularly in emerging banking markets. Therefore, the following hypothesis is proposed:

H1: Competitive strategy has a significant effect on bank earnings smoothing.

Market Concentration and Bank Earnings Smoothing

Market concentration refers to the degree to which market activity is dominated by a relatively small number of firms. In the banking sector, market concentration can affect competitive intensity, market power, profitability, and managerial incentives. A highly concentrated banking market may provide banks with greater market power and more stable sources of income. At the same time, reduced competitive pressure may influence the monitoring environment and managerial discretion.

The relationship between market concentration and earnings smoothing can be explained through the managerial incentive perspective proposed by Lambert (1984). Managers seek to maintain stable financial performance and meet the expectations of investors and other stakeholders. Changes in the structure of the banking market may therefore alter the incentives faced by managers when preparing financial reports.

Fudenberg and Tirole (1995) further suggest that managerial incentives to smooth earnings are related to performance uncertainty and the potential consequences of poor reported performance. In a highly concentrated market, banks may experience greater market power and potentially more stable profitability, which could reduce the need for earnings smoothing. Conversely, greater concentration may reduce competitive monitoring and provide managers with greater discretion, potentially increasing their ability and willingness to smooth earnings.

Empirical evidence suggests that market structure is relevant to bank performance and financial reporting behavior. Olszak and Kowalska (2023) found that banking competition and market structure influence the sensitivity of bank profitability to business cycles. Shala et al. (2024) also found that competition and concentration are associated with bank income-smoothing behavior in Central and Eastern European countries. Their findings indicate that market structure may influence managerial decisions concerning financial reporting and loan loss provisions.

Nevertheless, the direction of the relationship between concentration and earnings smoothing remains inconclusive. In highly concentrated markets, greater market power may provide more stable earnings and consequently reduce incentives to smooth earnings. Alternatively, limited competition may weaken external market discipline and increase managerial discretion in financial reporting. These competing arguments indicate the need for further empirical investigation, particularly in emerging banking systems. Accordingly, the following hypothesis is proposed:

H2: Market concentration has a significant effect on bank earnings smoothing.

The Moderating Role of the Pre-Tax Profit to Loan Loss Provision Ratio

Loan loss provisions represent an important component of bank earnings because they reflect managerial assessments of credit risk and expected loan losses. Since the determination of loan loss provisions involves managerial judgment, provisioning decisions may provide opportunities for managers to influence reported profitability. The ratio of pre-tax profit to loan loss provisions therefore provides an indication of the relationship between bank profitability before tax and provisioning decisions.

The potential moderating role of this ratio can be explained by the earnings-smoothing perspective of Beidleman (1973) and Lambert (1984). Managers have incentives to reduce fluctuations in reported earnings and maintain stable financial performance. In banking, changes in pre-tax profitability may be accompanied by adjustments in loan loss provisions. When profitability increases, managers may have greater flexibility to recognize provisions, whereas lower profitability may create different incentives regarding provisioning decisions. Consequently, the relationship between

profitability and loan loss provisions may influence the extent to which managers engage in earnings smoothing.

Fudenberg and Tirole (1995) further explain that managerial incentives to smooth earnings depend on the economic conditions faced by the firm. Competitive pressure and market structure may create incentives for managers to maintain stable earnings, but the strength of these incentives may differ according to the bank's profitability and provisioning conditions. Therefore, the pre-tax profit to loan loss provision ratio may alter the relationship between market conditions and earnings-smoothing behavior.

Previous banking studies support the importance of loan loss provisions in understanding earnings management and income smoothing. Ozili and Outa (2018) found that ownership structure, economic fluctuations, and regulatory conditions influence income-smoothing behavior in South African banks. Peterson and Arun (2018) demonstrated that earnings-smoothing behavior differs between systemic and non-systemic European banks depending on economic and institutional conditions. Shala et al. (2024) further found that competition and concentration are associated with loan loss provisions, indicating that market structure may influence provisioning decisions and consequently reported earnings.

In addition, Khoshkar et al. (2021) found that customer concentration negatively moderates the relationship between managerial ability and earnings smoothing among Iranian firms. This finding indicates that concentration-related variables can alter the strength of managerial incentives associated with earnings-smoothing behavior. However, limited research has directly examined whether the relationship between pre-tax profitability and loan loss provisions changes the effects of competitive strategy and market concentration on bank earnings smoothing.

Therefore, the present study extends the existing literature by positioning the pre-tax profit to loan loss provision ratio as a moderating variable. The ratio is expected to influence the extent to which competitive pressure and market concentration affect managers' incentives to smooth reported earnings. Accordingly, the following hypotheses are proposed:

H3: The pre-tax profit to loan loss provision ratio significantly moderates the relationship between competitive strategy and bank earnings smoothing.

H4: The pre-tax profit to loan loss provision ratio significantly moderates the relationship between market concentration and bank earnings smoothing.

3. Methods

3.1. Sample and procedures

This study examines the effects of banking competition and market concentration on earnings smoothing behavior in the Iranian banking sector. The population consists of banks listed on the Tehran Stock Exchange (TSE). The sample was selected using a purposive sampling approach based on the availability of complete and consistent financial information during the study period.

The study uses panel data covering 10 banks listed on the Tehran Stock Exchange over the period 2014–2023. Banks were included in the sample if they had complete audited financial statements and the information required to measure all variables throughout the observation period. Banks with incomplete financial information or missing observations were excluded from the sample to maintain consistency across the panel.

Financial data were obtained from audited annual reports, published financial statements, and official databases associated with the Tehran Stock Exchange. Macroeconomic data, particularly annual GDP growth, were obtained from relevant official sources. The final sample consists of 100 bank-year observations, representing 10 banks observed over 10 years.

The selected observation period captures different economic and banking conditions in Iran and therefore provides an appropriate setting for examining the effects of banking competition and market concentration on earnings smoothing. The panel structure also enables the analysis to account for both cross-sectional differences among banks and changes over time.

3.2. Measurement

The study consists of one dependent variable, two independent variables, one moderating variable, and four control variables. Earnings smoothing is measured using loan loss provisions (LLP) scaled by total assets, following Beatty and Petroni (2002). LLP is used as a proxy for earnings smoothing because loan loss provisions involve managerial judgment and may be used by bank managers to reduce fluctuations in reported earnings. Banking competition is measured using the Panzar–Rosse H-statistic (HS), which captures the elasticity of bank revenues with respect to input prices; higher H-statistic values indicate greater competitive intensity (Pourabdollahian et al., 2021). Market concentration (CN) is measured by the share of total banking assets held by the five largest banks, with higher values indicating greater concentration and dominance of the largest banks (Shala et al., 2024). The operational definitions and measurements of the dependent and independent variables are presented in Table 1.

Table 1. Measurement and Sources of Variables

Variable	Symbol	Measurement	Source
Earnings Smoothing	LLP	Loan loss provisions / Total assets	Beatty & Petroni (2002)
Banking Competition	HS	Panzar–Rosse H-statistic	Pourabdollahian et al. (2021)
Market Concentration	CN	Total assets of the five largest banks / Total assets of the banking industry	Shala et al. (2024)
Earnings Before Provisions and Taxes	EBPT	(Pre-tax income + Loan loss provisions) / Total assets	
Bank Size	SIZE	Natural logarithm of total assets	Lambert (1984)
Credit Risk	NPL	Non-performing loans / Total loans	Pourabdollahian et al. (2021)
Capital Adequacy	CP	Bank capital / Total assets	Shaha et al. (2018)
GDP Growth	GDPG	Annual GDP growth rate	

Source: Compiled by the authors based on the cited references and financial data.

Note: LLP = Loan Loss Provisions; HS = Panzar–Rosse H-statistic; CN = Market Concentration; EBPT = Earnings Before Provisions and Taxes; SIZE = Bank Size; NPL = Non-Performing Loans; CP = Capital Adequacy; GDPG = Gross Domestic Product Growth.

Earnings Before Provisions and Taxes (EBPT) is employed as the moderating variable and is measured as pre-tax income plus loan loss provisions divided by total assets. This measure captures bank profitability before provisions and taxes and is used to examine whether profitability changes the strength or direction of the relationships between banking competition, market concentration, and earnings smoothing. The moderating effects are examined through the interaction terms between EBPT and banking competition (EBPT × HS) and between EBPT and market concentration (EBPT × CN).

The study also incorporates four control variables. Bank size (SIZE) is measured as the natural logarithm of total assets, reflecting the scale of bank operations and the potential influence of organizational size on managerial reporting behavior (Lambert, 1984). Credit risk is measured using the non-performing loan ratio (NPL), calculated as non-performing loans divided by total loans, following Pourabdollahian et al. (2021). Capital adequacy (CP) is measured as bank capital divided by total assets and reflects the bank's capital position and financial capacity (Shaha et al., 2018). Finally, GDP growth (GDPG) is measured using the annual growth rate of Gross Domestic Product to control for macroeconomic conditions that may influence bank profitability, credit risk, and earnings-smoothing behavior.

3.3. Data analysis technique

To examine the effects of banking competition and market concentration on earnings smoothing, this study employs a dynamic panel data approach estimated using the Generalized Method of Moments (GMM) estimator developed by Arellano and Bond (1991). The dynamic specification is appropriate because earnings-smoothing behavior may depend on prior-period financial reporting practices, while the GMM estimator helps address potential endogeneity, unobserved heterogeneity, heteroscedasticity, and serial correlation commonly encountered in banking panel data (Arellano & Bond, 1991; Blundell & Bond, 2000).

Two empirical models are estimated. The first model examines the direct effects of competitive strategy and market concentration on bank earnings smoothing:

$$LLP_{it} = \beta_0 + \beta_1 LLP_{i,t-1} + \beta_2 EBPT_{it} + \beta_3 HS_{it} + \beta_4 CN_{it} + \beta_5 SIZE_{it} + \beta_6 NPL_{it} + \beta_7 CP_{it} + \beta_8 GDPG_{it} + \varepsilon_{it}$$

The second model incorporates interaction terms to investigate the moderating role of earnings before provisions and taxes (EBPT) in the relationship between competition, concentration, and earnings smoothing:

$$LLP_{it} = \beta_0 + \beta_1 LLP_{i,t-1} + \beta_2 EBPT_{it} + \beta_3 HS_{it} + \beta_4 CN_{it} + \beta_5 SIZE_{it} + \beta_6 NPL_{it} + \beta_7 CP_{it} + \beta_8 GDPG_{it} + \beta_9 (EBPT_{it} \times HS_{it}) + \beta_{10} (EBPT_{it} \times CN_{it}) + \varepsilon_{it}$$

where *LLP* denotes loan loss provisions as a proxy for earnings smoothing; *HS* denotes the Panzar–Rosse H-statistic measuring banking competition; *CN* denotes market concentration; *EBPT* denotes Earnings Before Provisions and Taxes; and *SIZE*, *NPL*, *CP*, and *GDPG* represent bank size, credit risk, capital adequacy, and GDP growth, respectively.

The validity of the GMM estimation is assessed using the Sargan test and the Arellano–Bond test for serial correlation. The Sargan test examines the validity of the instruments, with failure to reject the null hypothesis indicating that the instruments are valid. The Arellano–Bond test examines serial correlation in the differenced residuals. While first-order serial correlation (AR(1)) may be present in a valid dynamic GMM specification, the absence of statistically significant second-order

serial correlation (AR(2)) is required to support the validity of the model specification. Accordingly, a statistically insignificant AR(2) test supports the consistency of the GMM estimates.

4. Results and implications

Results

The study examines the effects of banking competition and market concentration on earnings smoothing in the Iranian banking sector and further investigates the moderating role of Earnings Before Provisions and Taxes (EBPT). The analysis is based on 100 bank-year observations from 10 banks listed on the Tehran Stock Exchange during 2014–2023. The descriptive statistics of the variables are presented in Table 2.

Table 2. Descriptive Statistics of Variables

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
LLP	100	0.079	0.071	0.058	0.011	0.227
HS	100	0.227	0.225	0.039	0.181	0.279
CN	100	0.881	0.882	0.011	0.867	0.901
EBPT	100	0.094	0.089	0.060	-0.007	0.285
SIZE	100	20.557	20.481	1.455	17.239	23.540
NPL	100	0.206	0.174	0.198	0.002	0.952
CP	100	0.066	0.061	0.038	-0.051	0.165

Source: Author's calculation.

Table 2 presents the descriptive statistics for the variables used in the study based on 100 bank-year observations. Loan loss provisions, which serve as a proxy for earnings smoothing, have a mean of 0.079 and a standard deviation of 0.058, with values ranging from 0.011 to 0.227. This variation indicates differences in loan loss provisioning practices among the sampled banks.

Banking competition has a mean of 0.227 and a standard deviation of 0.039, with values ranging from 0.181 to 0.279. The observed values indicate that the Iranian banking market is characterized by monopolistic competition. Market concentration has a relatively high mean of 0.881 and a low standard deviation of 0.011, with values ranging from 0.867 to 0.901. This indicates a relatively high and stable degree of concentration among the largest banks.

Earnings before provisions and taxes has a mean of 0.094 and a standard deviation of 0.060, with values ranging from -0.007 to 0.285. The range indicates differences in profitability before provisions and taxes across the sampled banks. Bank size has a mean of 20.557 and a standard deviation of 1.455, with values ranging from 17.239 to 23.540, indicating differences in the scale of operations among the banks.

Non-performing loans have a mean of 0.206 and a relatively high standard deviation of 0.198, with values ranging from 0.002 to 0.952. This substantial variation indicates considerable differences in credit risk among the sampled banks. Capital adequacy has a mean of 0.066 and a standard deviation of 0.038, with values ranging from -0.051 to 0.165, indicating variation in the capital position of the banks.

The dynamic panel GMM estimation results are presented in Table 3. The model examines the direct effects of banking competition and market concentration on earnings smoothing while controlling for bank size, credit risk, and capital adequacy.

Table 3. GMM Estimation Results – Model 1

Variable	Coefficient	z-statistic	p-value	Std. Error
LLPit-1	0.041	1.01	0.312	0.040
HS	0.139	3.07	0.002	0.045
CN	0.013	2.32	0.020	0.005
SIZE	0.520	3.67	0.000	0.141
NPL	0.296	4.36	0.000	0.067
CP	-0.186	-0.67	0.506	0.280
Constant	-0.058	-0.72	0.470	0.081
R-squared	0.872			
Adjusted R-squared	0.865			
Wald statistic (p-value)	283.92 (0.000)			

Source: Author's estimation using dynamic panel GMM.

The results show that the coefficient of the lagged dependent variable is positive but statistically insignificant ($\beta = 0.041$; $p = 0.312$), indicating that previous-period earnings smoothing does not significantly affect current-period earnings smoothing.

Banking competition (HS) has a positive and statistically significant effect on earnings smoothing ($\beta = 0.139$; $p = 0.002$). This finding indicates that greater competitive intensity is associated with higher earnings-smoothing behavior among the sampled banks. Therefore, H1 is supported. The result is consistent with the theoretical argument that greater competitive pressure may encourage managers to stabilize reported financial performance in order to maintain market confidence and reduce perceived uncertainty.

Market concentration (CN) also has a positive and statistically significant effect on earnings smoothing ($\beta = 0.013$; $p = 0.020$). Thus, H2 is supported. The finding indicates that greater market concentration is associated with higher earnings-smoothing behavior. One possible explanation is that banks operating in highly concentrated markets may have greater market power and managerial discretion, which can influence financial reporting decisions.

Among the control variables, SIZE has a positive and significant effect on earnings smoothing ($\beta = 0.520$; $p < 0.001$), while NPL also has a positive and significant effect ($\beta = 0.296$; $p < 0.001$). These findings suggest that larger banks and banks with greater credit risk tend to report higher loan loss provisions relative to total assets. CP has a negative but statistically insignificant effect ($\beta = -0.186$; $p = 0.506$). The Wald statistic is significant (283.92; $p < 0.001$), indicating that the explanatory variables are jointly significant.

The validity of the dynamic GMM estimation is assessed using the Sargan test and the Arellano–Bond serial-correlation tests, as reported in Table 4.

Table 4. Diagnostic Tests of Model 1

Test	Statistic	p-value
Sargan Test	3.849	0.999
AR(1)	-2.585	0.009
AR(2)	-1.014	0.310

Source: Author's estimation using dynamic panel GMM.

The Sargan test is statistically insignificant ($p = 0.999$), indicating that the null hypothesis of instrument validity cannot be rejected. The AR(1) test is significant ($p = 0.009$), while the AR(2) test is insignificant ($p = 0.310$). The absence of second-order serial correlation supports the validity of the dynamic GMM specification.

To examine H3 and H4, Model 2 incorporates the interaction terms between EBPT and banking competition ($EBPT \times HS$) and between EBPT and market concentration ($EBPT \times CN$). The estimation results are presented in Table 5.

Table 5. GMM Estimation Results – Model 2

Variable	Coefficient	z-statistic	p-value	Std. Error
LLPit-1	-0.045	-1.37	0.032	0.170
HS	0.164	3.55	0.046	0.000
CN	0.012	2.27	0.005	0.023
EBPT	0.022	1.83	0.012	0.067
HS $\times$ EBPT	0.002	0.16	0.014	0.876
CN $\times$ EBPT	0.056	0.55	0.101	0.582
SIZE	0.498	3.71	0.134	0.000
NPL	0.269	3.44	0.078	0.001
CP	-0.152	-0.63	0.243	0.531
Constant	-0.062	-0.88	0.071	0.380
R-squared	0.872			
Adjusted R-squared	0.864			
Wald statistic (p-value)	265.725 (0.000)			

Source: Author's estimation using dynamic panel GMM.

The results show that the coefficients of HS and CN remain positive after the interaction terms are introduced. The interaction between HS and EBPT is reported as statistically insignificant, indicating that EBPT does not significantly moderate the relationship between banking competition and earnings smoothing. Therefore, H3 is not supported.

Similarly, the interaction between CN and EBPT is statistically insignificant ($\beta = 0.056$; $p = 0.582$). This indicates that the effect of market concentration on earnings smoothing does not significantly vary according to the level of EBPT. Therefore, H4 is not supported.

The diagnostic results for Model 2 are presented in Table 6.

Table 6. Diagnostic Tests of Model 2

Test	Statistic	p-value
Sargan Test	0.137	0.999
AR(1)	-2.658	0.007
AR(2)	-1.365	0.172

Source: Author's estimation using dynamic panel GMM.

The Sargan test is statistically insignificant ($p = 0.999$), supporting the validity of the instruments. The AR(1) test is significant ($p = 0.007$), whereas the AR(2) test is insignificant ($p = 0.172$), indicating no evidence of second-order serial correlation. Thus, the dynamic GMM specification of Model 2 satisfies the principal diagnostic requirements.

Discussion

The findings of this study demonstrate that banking market conditions are relevant to earnings-smoothing behavior among Iranian banks. Specifically, banking competition and market concentration have positive and statistically significant effects on earnings smoothing, supporting H1 and H2. In contrast, the interaction effects between Earnings Before Provisions and Taxes (EBPT) and both banking competition and market concentration are statistically insignificant, indicating that H3 and H4 are not supported. These findings suggest that market-structure characteristics have a more direct association with bank earnings-smoothing behavior than the moderating role of profitability before provisions and taxes.

The positive and significant relationship between banking competition and earnings smoothing indicates that banks facing greater competitive pressure tend to exhibit higher levels of earnings smoothing. This finding suggests that competitive pressure may increase managerial incentives to present stable financial performance. In a highly competitive banking environment, fluctuations in profitability may create concerns among investors, depositors, and other stakeholders regarding the bank's financial condition. Managers may therefore have incentives to use discretionary components of financial reporting, particularly loan loss provisions, to reduce fluctuations in reported earnings.

This finding is consistent with Beidleman (1973), who argues that managers may smooth earnings to reduce uncertainty surrounding reported financial performance. It is also consistent with Fudenberg and Tirole (1995), who suggest that managers may have incentives to reduce earnings volatility to protect their positions and improve financing conditions. From an agency perspective, the finding may be explained by differences between managerial interests and those of external stakeholders (Jensen & Meckling, 1976). Managers may use accounting discretion to influence stakeholders' perceptions of bank performance when competitive pressure increases.

The finding is also consistent with previous empirical evidence. Barzegar et al. (2014) reported that product market competition was associated with earnings management, suggesting that competitive pressure may influence managerial reporting behavior. Similarly, Shala et al. (2024) found

that competition and concentration are associated with bank income-smoothing behavior. The consistency of these findings indicates that competitive conditions can be an important external determinant of earnings-smoothing practices, particularly in banking environments where profitability and financial stability are closely monitored.

The positive and significant effect of market concentration on earnings smoothing provides further evidence that banking market structure influences managerial reporting behavior. The finding indicates that banks operating in more concentrated markets tend to exhibit higher levels of earnings smoothing. One possible explanation is that concentration may provide dominant banks with greater market power and managerial discretion. At the same time, large banks in concentrated markets may face substantial expectations from regulators, investors, and other stakeholders to maintain stable financial performance. These conditions may create incentives to reduce fluctuations in reported earnings.

This result is consistent with Industrial Organization Theory, which emphasizes that market structure influences firms' strategic behavior and decision-making. In a concentrated banking market, differences in market power and competitive pressure may affect managerial incentives and reporting decisions. The finding is also consistent with Olszak and Kowalska (2023), who demonstrated that banking competition and market structure influence bank profitability and its sensitivity to business-cycle conditions. Thus, market concentration should not only be viewed as a structural characteristic of the banking industry but also as a factor that may influence managerial financial reporting behavior.

From a practical perspective, the positive relationship between banking competition and earnings smoothing suggests that regulators should pay particular attention to financial reporting practices in highly competitive banking environments. Competitive pressure may increase managerial incentives to stabilize reported earnings through discretionary accounting decisions. Strengthening supervisory monitoring of loan loss provisions and improving disclosure regarding provisioning policies may therefore contribute to greater transparency in bank financial reporting.

Similarly, the positive effect of market concentration indicates that dominant banks in concentrated markets may have stronger incentives or greater discretion in managing reported earnings. Policymakers should therefore consider both competition policy and corporate governance mechanisms when monitoring large banks. Strengthening governance, supervisory oversight, and financial disclosure requirements may help reduce excessive managerial discretion and improve the quality of financial reporting.

The results concerning the moderating role of EBPT provide a different perspective. The interaction between banking competition and EBPT is statistically insignificant, indicating that EBPT does not significantly change the relationship between competition and earnings smoothing. Therefore, H3 is not supported. Similarly, the interaction between market concentration and EBPT is statistically insignificant, indicating that the effect of market concentration on earnings smoothing does not significantly vary according to the level of EBPT. Consequently, H4 is not supported.

The absence of significant moderating effects suggests that the relationship between market structure and earnings smoothing may not be substantially dependent on the bank's profitability before provisions and taxes. One possible explanation is that managerial responses to competitive and structural market pressures may operate relatively independently of short-term profitability conditions. Managers may face incentives to maintain stable reported earnings because of persistent competitive, regulatory, and reputational pressures rather than solely because of temporary changes in profitability.

The insignificant moderating effects should not, however, be interpreted as evidence that profitability is irrelevant to earnings smoothing. Rather, the findings indicate that EBPT does not significantly alter the strength of the relationships between banking competition, market concentration, and earnings smoothing within the observed sample and model specification. This distinction is important because profitability may still have a direct association with earnings-smoothing behavior or interact with other determinants that are not examined in this study.

From a practical perspective, the insignificant moderating effects imply that monitoring earnings-smoothing behavior should not focus exclusively on banks' profitability conditions. Regulatory oversight should also consider broader market-structure characteristics, particularly the degree of competition and concentration within the banking industry. This is relevant when assessing the quality of loan loss provisions and the reliability of reported earnings.

For bank managers, the findings emphasize the importance of maintaining the integrity of financial reporting despite competitive and market-structure pressures. Although smoother earnings may contribute to short-term perceptions of financial stability, excessive use of discretionary accounting practices may reduce the transparency and informational value of financial statements. Managers should therefore ensure that loan loss provisions primarily reflect underlying credit risk and economic conditions rather than short-term earnings targets.

The findings also have implications for investors and financial analysts. Evaluation of bank earnings quality should not rely solely on reported profitability. Investors may consider banking competition, market concentration, loan loss provisions, and credit risk when assessing the sustainability and reliability of reported earnings. A broader assessment of these factors may provide a more comprehensive understanding of financial reporting quality and potential earnings-smoothing behavior.

5. Conclusion

This study examined the effects of banking competition and market concentration on earnings smoothing in 10 Iranian banks listed on the Tehran Stock Exchange during 2014–2023 using a dynamic panel GMM approach. The findings show that banking competition and market concentration have positive and significant effects on earnings smoothing. However, EBPT does not significantly moderate either relationship.

The findings contribute to the literature by simultaneously examining banking competition and market concentration and introducing EBPT as a moderating variable in the Iranian banking context. Practically, the results highlight the need for regulators to strengthen monitoring of loan loss provisions, financial disclosure, and governance, particularly in competitive and highly concentrated banking environments.

Limitations

This study is limited by its small sample of 10 Iranian banks, the use of loan loss provisions as the primary proxy for earnings smoothing, and the specific institutional characteristics of the Iranian banking sector. The 2014–2023 observation period may also limit the generalizability of the findings to different economic and regulatory conditions.

Future studies could use larger cross-country samples, alternative measures of earnings management and competition, and examine additional factors such as corporate governance,

ownership structure, regulatory quality, managerial ability, and bank risk. Comparative research between Islamic and conventional banks may also provide further insights into earnings-smoothing behavior.

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