Examining the Impact of Financial and Non-Financial Criteria Divergence on Bank Profitability Indicators

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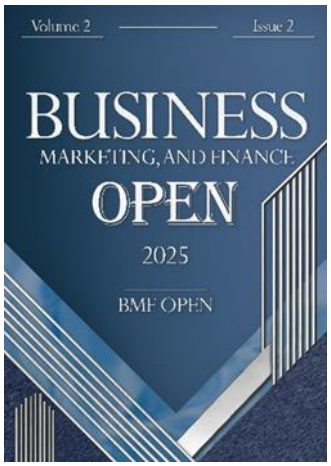

Citation: Daliri, H., Ramezani, A., Nasl Mosavi, S. H., & Modanlo Joibary, A. (2025). Examining the Impact of Financial and Non-Financial Criteria Divergence on Bank Profitability Indicators. *Business, Marketing, and Finance Open,* 2(2), 156-165.

Received: 02 January 2025
Revised: 05 February 2025
Accepted: 19 February 2025
Published: 01 March 2025

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Abstract: The primary objective of this study is to determine the impact of divergence between financial and non-financial criteria on bank profitability indicators. Given the influence of non-financial criteria on financial criteria and, consequently, their effect on profitability indicators, the present study focuses on the concept of divergence between financial and non-financial criteria. It aims to address the theoretical and research gap concerning the divergence between these criteria and its role in bank profitability indicators. This research is classified as an applied study based on its objective. The geographical scope of the study is a state-owned bank, and the statistical sample includes eleven non-financial performance-related criteria and three financial criteria over the period from 2009 to 2022. To test the hypotheses, structural equation modeling was employed using Smart PLS software. The test results indicate that the relationship between divergence (financial and non-financial criteria) and bank profitability indicators is statistically significant.

Keywords: Non-Financial Criteria, Financial Criteria, Divergence of Financial and Non-Financial Criteria, Bank Profitability Indicators.

1. Introduction

Financial reporting of economic entities reflects the informational needs and expectations of various groups of financial statement users who require such information to make sound economic decisions [1]. The more accurate and higher quality the financial statement disclosures are, and the less they are subject to manipulation, the more precise the analysis of past performance and future forecasts will be [2-4]. Accordingly, the Basel Committee recommends that banks, as the driving engines of the economy, provide information in their regular financial reporting and other public disclosures to facilitate market participants' evaluation of banks [5].

In recent decades, factors such as increased competition in financial markets, rising market volatility, and most importantly, declining operational profit margins have prevented banks from achieving their expected profitability. As a result, banks have shifted their revenue structure from traditional activities to fee-based operations derived from non-financial criteria or off-balance-sheet items to sustain profitability in today's dynamic and challenging

markets. While financial criteria generally reflect past performance, non-financial criteria may indicate actions that shape future behavior [6].

Thus, the disclosure of non-financial criteria has gained increasing attention due to its significance for financial statement users and financial reporting regulators. The utilization of these criteria in organizations' management control systems has attracted the interest of many researchers [7].

Dechow, Larson, and Sloan (2011) argue that changes in non-financial criteria and actual profits are usually aligned. For example, on average, a 10% increase in the number of stores, products, and employees should lead to an approximately 10% increase in profit. However, in firms engaged in financial reporting fraud, growth in non-financial criteria does not support financial performance growth [6].

Studies on the impact of e-banking development on bank profitability have shown that total bank assets and the number of ATMs have a significant positive effect on bank profitability. However, the effects of bank market concentration ratio, branch terminal devices, and point-of-sale (POS) devices on bank profitability have been significantly negative [8].

Given the claim that financial reports without the inclusion of non-financial criteria cannot provide complete and comprehensive information to users, and based on Kaplan and Norton's belief that effective judgment and decision-making about an organization is possible only when financial and non-financial criteria are considered together [9], the necessity of research in this area becomes evident.

Although several studies have examined the relationship between non-financial criteria and bank profitability indicators, concluding that the number of ATMs, PIN pads, tokens, POS devices, and bank size have a significant positive relationship with profitability indicators [10], and other studies have found that variables such as the number of branches, economic growth, and bank market share have a significant positive impact on bank profitability [11], the role of non-financial criteria in supporting financial criteria in shaping profitability indicators has been overlooked.

Accordingly, this study seeks to bridge this research gap by reviewing previous studies and focusing on net fee income (WEA), operating income (OIN), and net profit/loss (NIL) as financial criteria. Additionally, it considers the number of current interest-free accounts, the number of debit cards, the number of credit cards, the number of issued gift cards, the volume of foreign currency remittances issued, the balance of imported documentary credits, the number and amount of foreign currency guarantees, the number and amount of domestic currency guarantees issued annually, and the balance of domestic currency guarantees as non-financial criteria. The study aims to examine the role of divergence between these two groups in influencing three profitability indicators: "economic value added," "net profitability," and "net interest margin."

As a result, inspired by the study of Brzael and Bradley (2018), this research attempts to answer the central question: Is there a significant relationship between the divergence of financial and non-financial criteria and bank profitability indicators? If such a relationship exists, is it positive or negative [12]?

Thus, the present study proposes the main hypothesis that the divergence between financial and non-financial criteria affects bank profitability indicators. It examines the impact of this divergence on bank profitability indicators. It is expected that as non-financial criteria grow, related financial criteria will also exhibit similar growth, ultimately improving bank profitability indicators.

Accordingly, the study defines the following sub-hypotheses:

1. The divergence between non-financial and financial criteria affects economic value added.
2. The divergence between non-financial and financial criteria affects net profitability.

3. The divergence between non-financial and financial criteria affects the net interest margin.

2. Methodology

This study is applied in terms of its objective and descriptive in terms of its research method, aiming to determine the impact of divergence between financial and non-financial criteria on bank profitability indicators. Therefore, regarding data collection methods, the research follows both library and field research strategies. The data type is time series, and due to limitations in access to statistics and information, the data from a state-owned bank covering the years from 2009 to 2022 has been considered as the statistical population for the present study.

For data analysis, inferential statistical methods, the Kolmogorov-Smirnov test, and regression analysis using Smart-PLS software have been applied. In this research, following Brazel and Lail (2018), the term "non-financial criteria" refers to quantitative criteria related to capacity/performance, expected to have a simultaneous and positive relationship with revenue or profit growth while not being reported in the primary financial statements.

To measure the overall direction and performance of these criteria, the median year-over-year percentage change has been used. Each observation must have at least two years of comparable non-financial data to be included in the sample. Additionally, at least three different non-financial criteria were required to provide a reasonable measure of their median change.

When financial and non-financial criteria exhibit divergent behavior, it is expected that bank profitability indicators will be affected, and operational performance will align less with reported financial performance. This situation may indicate that a portion of the bank's assets has been allocated inefficiently or that the bank has made strategic errors in formulating its current operational policies and macro-level goal setting regarding specific levels of non-financial criteria.

Table 1. Research Variables

Variable Type	Variable Name	Abbreviation	Calculation Method
Independent (Financial)	Net Fee Income	WEA	Derived from the income statement
	Operating Income	OIN	
	Net Profit/Loss	NIL	
Independent (Non-Financial)	Number of Current Interest-Free Accounts	NGA	Derived from internal management reports and financial statement explanatory notes
	Number of Debit Cards	NAA	
	Number of Credit Cards	NCC	
	Number of Issued Gift Cards	NCA	
	Volume of Issued Foreign Currency Remittances	PYO	
	Balance of Imported Documentary Credits	IDB	
	Number of Foreign Currency Guarantees	NFOG	
	Amount of Foreign Currency Guarantees	TFOG	
	Number of Domestic Currency Guarantees Issued Annually	ING	
	Amount of Domestic Currency Guarantees Issued Annually	TING	
	Balance of Domestic Currency Guarantees	BING	

Control	Deposit Interest Rate	SHD	Derived from directives issued by the Central Bank and data from the Iranian Statistical Center
	Loan Interest Rate	MFR	
	Inflation Rate	INF	
	Non-Performing Loan Ratio	NPLs	Derived from financial statement explanatory notes
Dependent (Profitability Indicators)	Economic Value Added	EVA	EVA = NOPAT - (WACC * IC), where NOPAT represents net profit (loss) for the fiscal year, IC is invested capital, and WACC denotes the weighted average cost of capital
	Net Profitability	NPR	(Interest income - Interest expense) divided by average total assets
	Net Interest Margin	NDPR	(Interest income from loans divided by total loans) - (Interest expense on customer deposits divided by total customer deposits)

Following the model of Brazel and Lail (2018), the divergence between financial and non-financial criteria is measured using the following equation, which assesses divergence based on the absolute value of the difference between the percentage change in each financial criterion and the median percentage change of non-financial criteria in the same year:

Equation 1:

$$\mathbf{DIFF(i,t) = \%CHANGE\_FM(i,t) - \%MEDCHNGE\_NFM(i,t)}$$

Equation 2:

$$\mathbf{ABS\_DIFF(i,t) = |DIFF(i,t)|}$$

The reason for using the absolute value of the difference (instead of a signed **DIFF**) is that overall divergence, whether positive or negative, is expected to impact profitability indicators. Accordingly, a higher or lower absolute difference between financial and non-financial criteria changes is associated with a more divergent condition.

The median percentage change of non-financial criteria (**%MEDCHNGE_NFM(i,t)**), measured from the end of period **t-1** to the end of period **t**, is used as an alternative variable to represent the available information for these criteria. The median percentage change is preferred over the average change to prevent excessive influence from a single non-financial criterion with an extreme percentage change.

For analyzing each profitability indicator under conditions of financial and non-financial criteria divergence, the following regression model (Equation 3) is employed:

Equation 3:

$$\mathbf{PI(i,t) = \beta(0) + \beta(1)ABS\_DIFF(i,t) + \beta(2)SHD(t) + \beta(3)MFR(t) + \beta(4)INF(t) + \beta(5)NPLs(t) + \varepsilon(t)}$$

The dependent variable **PI** is assigned a value of **1** for profitability indicators that exhibit positive values and **0** otherwise. This model focuses on **β(1)**, where a positive coefficient would indicate that non-financial criteria do not support the financial criteria reported in financial statements, implying that the bank has not demonstrated an optimal behavior in allocating its assets and liabilities. Conversely, a negative coefficient would suggest the opposite.

To identify relevant criteria and components among non-financial criteria, the significance coefficient and factor loadings of these constructs will be examined, ultimately identifying the divergent variables.

3. Findings

The calculations presented in Table 2 indicate that the significance level for Bartlett's test is less than 0.05, which suggests that the null hypothesis of no internal dependency between the variables is rejected (KMO = 0.79).

Table 2. Results of Bartlett's Sphericity Test for Factor Analysis of Research Components

Chi-Square Statistic	Degrees of Freedom	Significance Level
106.049	28	0.002

The results of the Kolmogorov-Smirnov test, used to assess the normality of the dependent variables in this study, are presented in Table 3:

Table 3. Results of Kolmogorov-Smirnov Test

Variable	Economic Value Added	Net Profitability	Net Interest Margin
Probability Value	0.615	0.896	0.997
Test Statistic	0.757	0.575	0.610

Since the results obtained for the dependent variables exceed the 5% error threshold, it can be concluded that all variables are normally distributed.

Hypothesis testing was conducted using the structural equation modeling (SEM) method. Initially, the median percentage changes of non-financial criteria were examined and their absolute differences from the percentage changes in financial criteria were calculated to identify divergent criteria. If the percentage differences between non-financial and financial criteria were significantly large (not close to zero), they were considered divergent variables.

The results of the Z significance coefficient test for independent variables indicated that the coefficients for the number of debit cards, the balance of domestic currency guarantees, the balance of imported documentary credits, the number and amount of domestic currency guarantees issued annually, and the number and amount of foreign currency guarantees were all below 1.64. This means that the median percentage changes in these variables did not show a statistically significant relationship with the percentage changes in financial criteria at a 90% confidence level, thus classifying them as divergent variables.

The factor loadings analysis produced similar results to the Z significance test, as the factor loadings for the number of debit cards, the balance of imported documentary credits, the balance of domestic currency guarantees, the number and amount of domestic currency guarantees issued annually, and the number and amount of foreign currency guarantees were all below 0.4. These variables were thus considered divergent from financial criteria. Before eliminating other criteria (classified as non-divergent variables), their significance coefficients and factor loadings were reassessed.

The test results, illustrated in Table 4, indicate that the number of issued gift cards, the number of credit cards, the number of current interest-free accounts, and the volume of issued foreign currency remittances were non-divergent and should be removed from the model.

Table 4. Significance Coefficient for Non-Divergent Variables

Variable	Relationship	Significance Coefficient	Probability Value	Result
Number of Issued Gift Cards	NCA ->	2.883	0.004	Confirmed
Number of Credit Cards	NCC ->	2.079	0.038	Confirmed
Number of Current Interest-Free Accounts	NGA ->	2.683	0.008	Confirmed
Volume of Issued Foreign Currency Remittances	PYO ->	2.047	0.041	Confirmed

Next, Cronbach's alpha, composite reliability, and RHO_A index were calculated for the studied criteria and reported in Table 5. To assess external reliability, the average variance extracted (AVE) was used, confirming the external reliability of the study.

Table 5. Average Variance Extracted (AVE)

Criteria	Cronbach's Alpha	RHO_A	Composite Reliability	AVE
Non-Financial	0.683	0.714	0.807	0.518
Financial	0.943	0.946	0.972	0.946

The R-squared (R^2) coefficient indicates the effect of each independent variable on the dependent variable. The R^2 values for all endogenous (dependent) constructs are presented in Table 6, confirming the strong fit of the structural model based on the R^2 criterion.

Table 6. Final Model R^2 Values

Variable	R Square	R Square Adjusted
Financial Criteria	0.759	0.706

With the divergent criteria identified, the next step was to examine the impact of these variables on bank profitability indicators and answer the question: How does increased divergence affect bank profitability indicators?

To identify relevant criteria and components among divergent variables, their significance coefficients and factor loadings were analyzed. The findings presented in Table 7 indicate that the Z significance coefficient for the number and amount of foreign currency guarantees and the balance of imported documentary credits was less than 1.96, with factor loadings below 0.4. Therefore, these variables lacked the necessary significance for measurement and were excluded from the analysis.

A re-examination of the significance coefficients for the remaining divergent variables (as presented in Table 8) showed that all Z-values exceeded 1.96, and their confirmed factor loadings were above 0.4, validating their importance in the model.

Table 7. Significance Coefficient and Factor Loading for Divergent Variables

Variable	Relationship	Factor Loading	Significance Coefficient	Probability Value	Result
Number of Debit Cards	NAA -> Divergent	0.931	2.346	0.019	Confirmed
Number of Foreign Currency Guarantees	NFOG -> Divergent	0.252	1.378	0.169	Rejected
Amount of Foreign Currency Guarantees	TFOG -> Divergent	0.031	0.07	0.944	Rejected
Number of Domestic Currency Guarantees Issued Annually	ING -> Divergent	-0.577	2.014	0.087	Confirmed
Balance of Domestic Currency Guarantees	BING -> Divergent	-0.782	2.224	0.027	Confirmed
Amount of Domestic Currency Guarantees Issued Annually	TING -> Divergent	-0.741	2.168	0.031	Confirmed
Balance of Imported Documentary Credits	IDB -> Divergent	0.312	1.839	0.067	Rejected

Table 8. Confirmatory Significance Coefficient Analysis for Divergent Variables

Variable	Relationship	Significance Coefficient	Probability Value	Result
Number of Debit Cards	NAA -> Divergent	2.186	0.029	Confirmed

Number of Domestic Currency Guarantees Issued Annually	ING -> Divergent	1.981	0.069	Confirmed
Balance of Domestic Currency Guarantees	BING -> Divergent	2.257	0.024	Confirmed
Amount of Domestic Currency Guarantees Issued Annually	TING -> Divergent	2.198	0.028	Confirmed

According to the Smart-PLS data analysis algorithm, the relationships between variables were assessed using two indices: the significance coefficient and the path coefficient (the standardized factor loading for conceptual model paths). Structural equation modeling (SEM) was employed for hypothesis testing, and the results of the main hypothesis are analyzed in Table 9.

Table 9. Significance Coefficient and Factor Loading for the Structural Model of the Main Hypothesis

Hypothesis	Independent Variable	Dependent Variable	Factor Loading	Significance Coefficient	Result
Main: The divergence between financial and non-financial criteria affects bank profitability indicators	Divergence of Financial and Non-Financial Criteria	Bank Profitability Indicators	-0.705	2.63	Hypothesis Accepted

Based on the information in Table 9, the following conclusions can be drawn:

- The divergence between financial and non-financial criteria affects bank profitability indicators by -0.705. This means that if the percentage difference between financial and non-financial criteria (number of debit cards, number and amount of domestic currency guarantees issued annually, and balance of domestic currency guarantees) decreases (i.e., they become more convergent), bank profitability indicators improve. Since the relationship is negative (-0.705), it implies that a one-unit decrease in divergence results in a 0.70-unit increase in bank profitability indicators with 95% confidence. The factor loading is also well above 0.50, indicating a strong explanatory power for this construct.
- The significance coefficient for the relationship between divergent variables and bank profitability indicators is 2.63, which is greater than 1.96, confirming that the divergence between financial and non-financial criteria significantly affects bank profitability indicators at the 95% confidence level.
- The path coefficient of -0.705 suggests that the divergence between financial and non-financial criteria has a strong and inverse impact on bank profitability indicators.
- Although the balance of imported documentary credits and the number and amount of foreign currency guarantees were identified as divergent variables, their divergence did not significantly impact bank profitability indicators.

The results of the sub-hypothesis evaluations are analyzed in tables below.

Sub-Hypothesis 1: The divergence between financial and non-financial criteria affects Economic Value Added (EVA).

Table 10. Regression Model Processing Coefficients for Sub-Hypothesis 1 (Dependent Variable: Economic Value Added)

Variable	Factor Loading	Significance Coefficient	Probability Value	Result
Divergence between Financial and Non-Financial Criteria	-0.60	2.566	0.011	Hypothesis Accepted

The results of Sub-Hypothesis 1 indicate that the F-statistic significance level is below 0.05, confirming that the hypothesis is accepted with 95% confidence. This suggests that there is a significant relationship between the divergence between financial and non-financial criteria and Economic Value Added (EVA) (2.566 > 1.96).

This means that as the percentage difference between the median changes in non-financial criteria and financial criteria decreases, it positively influences the bank's EVA. The path coefficient of -0.60 indicates a moderate and inverse effect of divergence on EVA, meaning that a one-unit decrease in divergence improves EVA by 0.60 units.

Sub-Hypothesis 2: The divergence between financial and non-financial criteria affects Net Profitability (NPR).

Table 11. Regression Model Processing Coefficients for Sub-Hypothesis 2 (Dependent Variable: Net Profitability)

Variable	Factor Loading	Significance Coefficient	Probability Value	Result
Divergence between Financial and Non-Financial Criteria	-0.57	1.938	0.053	Hypothesis Accepted

The results of Sub-Hypothesis 2 show that, although the significance coefficient (1.938) is slightly below 1.96, the hypothesis is accepted at a 90% confidence level.

The statistical significance of the independent variable (financial and non-financial criteria divergence) indicates that this variable influences the dependent variable (Net Profitability, NPR) within the presented regression model. This suggests that as the percentage difference between the median changes in non-financial criteria and financial criteria decreases, it affects the bank's net profitability.

Given the negative factor loading, if the difference between financial and non-financial criteria decreases by one unit, the bank's net profitability improves by 0.57 units.

4. Discussion and Conclusion

Since the misalignment of changes in non-financial criteria relative to financial criteria and profit may lead investors to scrutinize operational efficiency, management's control over service delivery processes, and overall strategic management, the findings of this study—aimed at examining the impact of financial and non-financial criteria divergence on bank profitability indicators—demonstrate that the divergence between financial and non-financial criteria significantly affects bank profitability indicators. Therefore, bank managers' efforts in monitoring and controlling the divergence between these two groups of criteria play a crucial role in improving profitability indicators.

The results indicate that four variables—the number of issued gift cards, the number of credit cards, the number of current interest-free accounts, and the volume of issued foreign currency remittances—are non-divergent relative to financial variables, whereas seven variables—the number of debit cards, the amount of domestic currency guarantees issued annually, the balance of domestic currency guarantees, the balance of imported documentary credits, the number of domestic currency guarantees issued annually, the number of foreign currency guarantees, and the amount of foreign currency guarantees—are divergent relative to financial variables.

It is noteworthy that the amount of foreign currency guarantees, the balance of imported documentary credits, and the number of foreign currency guarantees were not found to impact bank profitability indicators, as their significance coefficients and factor loadings were below the acceptable threshold. Among the eleven selected non-financial criteria, four variables— the number of debit cards, the amount of domestic currency guarantees issued annually, the balance of domestic currency guarantees, and the number of domestic currency guarantees issued

annually—were identified as divergent non-financial criteria that significantly influence bank profitability indicators.

Bank management can focus on these variables and reduce their gap with financial criteria to improve bank profitability indicators. From another perspective, while it was expected that the behavior of non-financial criteria would support the figures reported in financial statements, this study found that seven non-financial criteria did not behave as expected and exhibited divergence from financial criteria. This necessitates supplementary managerial reporting by banks regarding this divergence and the failure of non-financial criteria to support financial criteria.

It is evident that a mandatory requirement for all banks by the Central Bank of Iran to disclose and publish quantitative non-financial performance-related criteria, along with an independent institution ranking banks based on these criteria, could significantly assist all stakeholders in assessing bank management performance and the quality of financial statements.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all participants who participate in this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

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