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Factors Affecting Bank Profitability in Türkiye

Türkiye'de Banka Karlılığını Etkileyen Faktörler

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ABSTRACT

The purpose of this study is to examine the factors affecting commercial bank profitability in Türkiye using panel data analysis for the period 2012-2023. In this framework, there are 240 observations of 20 deposit banks in the analysis. Return on assets (ROA) and return on equity (ROE) are used as an indicator of profitability and dependent variables. The results of the analysis show that bank-specific determinants such as bank size, equity size and non-performing loans play a significant impact on bank profitability. The only macroeconomic factors affecting bank performance is the inflation. Bank size, equity size and inflation play significant and positive role in explaining bank profits, while the effect of non-performing loans is negative. It means that the high profitability of Turkish banks is generally associated with well-capitalized banks with high lending capacity and low credit risk with effective cost management is important for the banking system. Finally, the estimated effect of external variables except inflation did not support the significant effect on bank performance.

Anahtar Kelimeler:
Banka Karlılığı,
Ticari Bankalar,
Panel Veri Analizi

Jel Kodları:
C23, E44, O16

ÖZET

Bu çalışmanın amacı, Türkiye'deki ticari banka kârlılığını etkileyen faktörleri 2012-2023 dönemi için panel veri analizi kullanarak incelemektir. Bu çerçevede analizde 20 mevduat bankasına ait 240 gözlem yer almaktadır. Kârlılığın ve bağımlı değişkenlerin göstergesi olarak aktif kârlılığı (ROA) ve özsermaye kârlılığı (ROE) kullanılmaktadır. Banka büyüklüğü, özsermaye büyüklüğü ve takipteki krediler gibi bankaya özgü belirleyiciler banka karlılığı üzerinde önemli bir etkiye sahiptir. The only macroeconomic factors affecting bank performance is the inflation. Banka büyüklüğü, özsermaye büyüklüğü ve enflasyon değişimi banka karlarını açıklamada anlamlı ve pozitif rol oynarken, takipteki kredilerin etkisi ise negatif yöndedir. Bu durum Türk bankalarının yüksek kârlılığının genel olarak iyi sermayeli, yüksek kredi verme kapasitesine sahip bankalarla ilişkilendirildiği ve etkin maliyet yönetimi ile düşük kredi riskinin bankacılık sistemi açısından önemli olduğu anlamını taşır. Son olarak enflasyon dışındaki dışsal değişkenlerin banka performansı üzerinde tahmini etkisi anlamlı düzeyde değildir.

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1. INTRODUCTION

All transactions involving money require trust. A certain level of profitability is important for the healthy operation of the banking system and effective real sector financing. Additionally, they affect the distribution of capital, private firms' operations expansion, industrial, and economic growth. According to the BRSA report (Banking Regulation and Supervision Agency), the share of banks' assets in the financial sector is 82.6 percent (BRSA, 2023: 13). Hence, the smooth operating of the banking system is necessary not only for its operational profitability, but also for the well functioning of the economy. Therefore, identifying the factors that affect bank profitability in terms of macroeconomic, bank-specific and industry-specific factors has received great attention in the literature.

The increase in global (the economic problems experienced after the Russia-Ukraine war and the Covid-19 epidemic) and national risks (especially the Kahramanmaraş-centered earthquake and others), the structural transformations brought about by digitalization, and the increased risks as a result of the phenomenon of sustainability affect the functioning of the banking sector and the credit market.

Actually, the Turkish banking sector has increased credit risk in banks due to negative macroeconomic balances. It faces serious problems such as high exchange rate, interest rate, inflation rate, liquidity risks and moral hazard problems. The increase in interest rates, the depreciation of the Turkish Lira and the economic contraction negatively affect the profitability of banks. It emphasized that financial crises have some effects on the determinants of banks' profitability. At least it is clear that it affects the lending behavior of banks.

On the other hand, technological innovations, digitization, and artificial intelligence have continued to influence the change in banking practices. In summary, it is necessary for monitoring the financial situation and risks of the banking sector and the compliance of its activities with the legal legislation, and to analyze all this together with macroeconomic developments and applied policies.

Determining internal and external factors affecting bank performance in both crisis and normal market conditions has received and continues to get attention in the financial literature. Because, understanding the factors affecting bank profits is an important data and indicator for the well-functioning of financial institutions and policy makers. That's why, the potentials and risks of the banking system should be evaluated at the micro and macro level jointly.

Bank profitability is a crucial indicator of a financial institution's health and its ability to sustain operations, reward shareholders, and fulfill its role in the economy. Understanding the drivers of bank profitability has been a central concern in academic research, given the role deposit banks play in economic development. However, the factors that affect profitability can vary greatly depending on economic cycles, regulatory systems, and the competitive environment. This research stems from the need to understand how these changes affect bank performance in emerging markets such as Türkiye, where economic growth is more volatile and regulatory environments are still evolving. The main source of motivation for this study is to understand the bank-specific and macroeconomic factors impact on bank profitability for the analyzed period of 2012-2023.

2. LITERATURE REVİEW

There have been an extensive study that seeks to identify the variables affecting bank profitability, which is measured mostly by return on assets, return on equity and net interest margin. Bank profitability is sensitive not only to bank level factors but also liable to macroeconomic conditions. The determinants of bank profitability are typically divided into two main groups in literature which are named internal (bank's specific characteristics) and external (financial industry and economic environment) factors.

The internal factors are defined as the individual bank characteristics which affect the bank's performance and are basically influenced by the internal decisions of bank management. Internal factors include bank size, capital adequacy ratio, management efficiency, diversification income, liquidity risk, and credit risk. External factors are outside bank management´s control but impact its economic and financial structure. External factors are listed as market concentration, inflation, and gross domestic product.

The studies conducted in the literature focused on the profitability factors of the cross country (Abdilahi & Davis, 2023; Peterson,2021; Le & Ngo, 2020; Kohlscheen et al., 2018; Djalilov & Piesse, 2016; Petria et al., 2015; Flamini et al, 2009; Goddard et al., 2004; Demirguc-Kunt & Huizinga, 1999) or individual countries' banking systems. However, most studies heavily concern the individual country analysis. Table 1 shows the individual

country literature review including the data set, analyzed time period, method and the findings. This literature review summarizes some of the important findings and insights from those studies.

Table 1. Literature Review

Author(s)	Scope of Study	Method	Positive impact on Profitability	Negative impact on Profitability
Mashamba & Chikutuma (2023)	11 deposit banks of Zambia for the period 2011 to 2020	Panel data, GMM Estimation Technique	Non-interest income, Liquidity, Cost-to-income ratio, Tier 1 capital, and Bank stability	Asset quality, Bank quality
Javaid et al (2015)	10 top deposit banks of Pakistan between 2004-2008	Pooled Ordinary Least Square Model (POLS)	Loans, Equity size, Deposits	Bank size
Davydenko (2011)	Ukraninian banking sector between 2005 and 2009	Arellano Bond GMM estimation	Bank size, Concentration ratio, GDP, The exchange rate depreciation, Inflation	Administrative expenses as percent of total assets, Provions for loans
Ramadan et al. (2011)	10 Jordanian banks over the period 2001 to 2010	Fixed Effects Regression Model	Capital adequacy, Loans	Credit risk, Cost management
Dietrich & Wanzenried (2011)	453 Commercial banks in Switzerland between 1999 and 2008	Arellano Bond GMM estimation	Equity size	Cost-to-income
Sufian & Chong (2008)	Philippines commercial banks for the period 1990 to 2005	Fixed and Random Effects Regression Model	Non-interest income, Capitalization	Bank size, Credit size, Non-interest expense, Inflation
Athanasoglou et al. (2005)	Banks in Greece over the period 1985-2001	Fixed Effects and GMM Estimation Technique	Equity size, Labor productivity, Cyclical output, Inflation	Credit risk, Operating expenses
Erdoğan (2024)	24 commercial banks in Türkiye between 2016-2023	Panel data analysis	Capital adequacy ratio, BIST100 Index	Non-performing loans, Bond yields
Karadayi (2023)	8 privately-owned deposit banks operating in Türkiye over the period 2002 to 2022	Panel data analysis	Liquidity ratio, deposit ratio, The non-interest rate of income and loan ratio	Equity ratio (Equity/Total Assets)
Doğan &Yildiz (2023)	23 public, private and foreign banks in Türkiye for the period 2007 to 2020	Dynamic Generalized Method of Moments (GMM) and Fixed Effect Model (FEM)	Inflation rate and GDP growth rate, equity to total assets rate - ROA/ROE based, positive relation between ROA and ROE, and 1-year and 2-year lagged ROA and ROE-GMM method	Operating expenses-ROA/ROE based
Büyükoğlu (2023)	11 domestic and 11 foreign banks in Türkiye between 2011 and 2021	GMM Estimation Technique	Ratio of total deposits to total assets, ratio of total loans to total assets ratio of interest income to total	Capital adequacy-foreign banks

			assets -Domestic banks GDP-Foreign banks	
Bayrakcı (2022)	10 top deposit banks in 2020, ranked according to their asset size in 2020	LASSO Regression Method	Securities portfolio / Total assets ratio variables, Equity-ROA/ROE based GDP- ROE based	Inflation, Nonperforming loans and -ROA/ROE based ROA-based
Bal & Sönmezer (2022)	36 Deposit banks in Turkey between 1989 and 2015	Fixed Effects Regression Model	Credit risk, Funding cost, GDP growth, Illiquidity	Operating cost
Topak & Talu (2017)	10 Commercial banks in Turkey between 2005 and 2015	Panel Data Analysis	Bank size, Interest revenue from loans/interest expense on deposits, Net fees and commissions revenues/total expenses	Credit risk, Capital adequacy, The ratio of other operating expenses to total operating revenues
Belke & Unal (2017)	23 Turkish Deposit banks for the period 2005Q1-2015Q4	Panel Data Analysis	The ratio of interest on loans over deposits, The ratio of net fees and commissions revenues to total operating expenses, Bank size	Credit risk, Capital adequacy, Other operating expenses over total operating revenues, Nonperforming loans ratio
Ozcan (2017)	26 Commercial banks in Turkey between 2005 and 2015	Fixed and Random Effects Panel Data Analysis	Income diversification, Deposit level, Bank scale, and Bank stability	Credit risk, lending level, operating expenses, capital adequacy
Ozgur & Gorus (2016)	Turkish deposit banks between 2006:1 and 2007:2	Multiple Regression Model with OLS Method	Net interest revenues/Average total assets, Equity size	Nonperforming loans ratio, Policy interest rate
Turgutlu (2014)	30 Deposit banks in Turkey for the 2006Q4-2012Q2 period	System Generalized Method of Moments	Bank size, Capital ratio, Total loans, managerial efficiency, Financial soundness	Cost-to-income ratio (managerial efficiency), Off-balance-sheet liabilities
Demirhan (2013)	Turkish commercial banks between 2003Q4 and 2012Q2	GMM Estimation Technique	Equity size, Non-interest Revenues/Total Assets	GDP growth, Inflation
Akbaş (2012)	26 Turkish deposit banks in Turkey for the 2005-2010 period	Panel Data Analysis	-	Loan loss provisions/ gross loans, Total costs/total income, HHI for deposits /assets, Inflation, Equity, Bank size,
Alper & Anbar (2011)	10 Turkish deposit banks between 2002-2010	-	Asset size, Non-interest income, Real interest rate	Loans/assets, Loans under followup/loans
Sayilgan & Yildirim (2009)	Turkish commercial banks over the period 2002 to 2007	Multi-Variable Single-Equation Regression Method	Industrial production index, GDP, Capital adequacy	Consumer price index inflation, The first difference of ratio of offbalance sheet assets to total assets

Some studies are specifically focused on the determinants of bank profits for the pre-crises, in the crisis or after the crises period (Taylor et al., 2022; Bouzgarrou et al., 2018; Adelopo et al., 2017; Demirhan, 2013; Beltratti & Stulz, 2012; Dietrich & Wanzenried, 2011; Sufian & Habibullah, 2010; Abbasoglu et al., 2007). Most of these studies reveal that internal and external independent variables are sensitive to pre-crise, in-crise and post-crise period.

Taylor et al.'s (2022) research for five (5) Sub-Saharan African countries shows that cost efficiency and revenue diversification during the epidemic have a positive impact on bank profitability. Bouzgarrou et al. (2018) reveal that foreign banks were more profitable than domestic banks both pre-crises (2000-2006) and during the financial crisis (2007-2012) period for 170 commercial banks operating in France measured by the ROA, NIM and ROE. Likewise, Abbasoglu et al. (2017) findings indicate that foreign banks operating in the Turkish banking system outperform domestic banks using ROA and ROE in 2001 banking crises.

Adelopo et al.'s (2017) study for West African states indicate that there is a significant relationship between bank-specific determinants (size, cost management, and liquidity) and bank profitability (ROA) before (1999-2006), during (2007-2009), and after (2010-2013) the financial crisis. Demirhan find that there is no statistically significant difference between ROA before (2003-September 2008) crisis and ROA (December 2008-June 2012) after crisis.

Beltratti & Stulz (2012) investigates the validity of various hypotheses put forward as to why banks performed so poorly during the crisis for 440 deposit banks in 32 countries over the period of July 2007–December 2008. Their results give an evidence for large banks from countries with more restrictions on bank activities performed better and decreased loans less in crises period. Dietrich & Wanzenried (2011) investigate the factors affecting the profitability of 372 commercial banks in Switzerland separately for the pre-crisis period (1999–2006) and the crisis (2007–2009) period to analyze the impact of the recent financial crisis. The analysis results confirm the findings of previous studies on bank profitability.

Studies have generally suggested significant negative relationships between bank profitability and operating costs, based on the view that cost distorts profit and is negatively related to performance. This effect exacerbates especially in crisis period (Taylor et al., 2022; Bouzgarrou et al., 2018; Adelopo et al.,2017; Beltratti & Stulz, 2012; Dietrich & Wanzenried, 2011; Sufian & Habibullah, 2010).

Credit risk: The loan loss provisions did not have a statistically significant and negative effect on bank profitability before the crisis, but have significantly increased during the crises (Taylor et al., 2022; Adelopo et al., 2017; Beltratti & Stulz, 2012; Dietrich & Wanzenried,2011).

The relationship between bank size and profitability in precrises, crises and post crises period is positive (Adelopo et al.,2017; Beltratti & Stulz, 2012; Dietrich & Wanzenried,2011). But some studies find no find no relationship with bank performance (Tallor et al., 2022). Some studies find a positive and significant relationship between size and capital strenght with profitability (Adelopo et al.,2017;), while others find no relationship (Taylor et al., 2022; Dietrich & Wanzenried, 2011).

Most studies find no relationship between GDP and financial profitability before and in crisis period (Taylor et al., 2022; Adelopo et al.,2017; Beltratti & Stulz, 2012; Dietrich & Wanzenried, 2011). Inflation has a significant but negative (Taylor et al., 2022; Adelopo et al.,2017) relationship with profitability during the financial crisis.

As seen in the literature review given in Table 1, distinctive studies produce different results. Factors explaining bank performance demonstrate variability even in the analysis made for the same country depending on the methods and time period that is used. However, most individual country analysis results reveal that the same variables affect bank performance at different levels due to differences in country dynamics as economic, social, political and cultural practices.

3. DATA AND METHODOLOGY

Annual bank level data of 20 private deposit banks in Türkiye is used for the period of 2012-2023. The profitability levels of 20 deposit banks operating in the Turkish banking system are analyzed by using panel data analysis. Because public banks operate with different motives, the analysis in this study is limited only to private deposit banks. The source of data is the annual reports of commercial banks taken from The Banks Associations of Türkiye's (TBB) website which includes financial reports such as balance sheet, income statement. Key financial indicators data are employed from the Central Bank of Türkiye (TCMB) and the Turkish Statistical Institute (TUIK). The number of bank observations in the study is 240.

Bank profitability is usually measured by the return on assets (ROA), the return on equity (ROE) and/or the net interest margin (NIM) reported by a bank. Following the general trend in the literature this study uses ROA and ROE as the dependent variable. ROA is calculated by dividing net profit after tax by total assets and represents the return obtained from the bank's invested assets. The asset profitability ratio is one of the commonly used measures of how efficiently a financial institution uses its assets to generate profit. An increase in the ROA indicates that the financial institution can generate more profit with fewer assets. In this sense, it is seen as an important measure of managerial efficiency.

ROE is a measure of a company's financial performance. ROE is the rate used to measure the profitability of the capital invested by the shareholders of the business. It allows business owners to see how effectively their invested capital is being used. In other words, it shows the management performance of the financial institution.

This study uses macro-economic and bank-specific financial variables for determining the profitability indicators which are widely used in the literature (Table 2). Therefore, bank-specific and macroeconomic variables are included in the regression. The regression model is in the following form:

$y_{jt} = \delta_j + \alpha' X_{ijt} + \beta' X_{et} + \varepsilon_{jt}$

Here:

y_{jt} refers to the dependent variable and observation on profitability (ROA) and/or (ROE) for bank i at time t

j refers to an individual bank

t refers to year

X_i refers to the internal variables of a bank

X_e refers to the external variables of a bank

δ refers to the speed of adjustment to equilibrium

α and β are coefficients while ε_{jt} is the error term.

The study's data sources and relevant information are given in Table 2. As indicated in Table 2, return on assets (ROA) and return on equity (ROE) are used as independent variables. Independent variables are classified into two groups. The first group includes bank-specific (controlled) internal factors such as bank size, credit risk, income diversification, management of expenses, and capital strength. The second group includes macroeconomic (uncontrolled) factors such as economic growth, inflation, and stock market capitalization. The panel data regression results and significance levels obtained are given in Table 5.

Table 2. Summary Information of the Variables

Variables	Notation	Description
Dependent variables		
Return on Assets	ROA	Profitability measure
Return on Equity	ROE	Profitability measure
Internal variables		
Bank size	TA	Natural log of total assets
Nonperforming loans over total loans	NLP/TL	Credit risk measure
Non-interest income over total assets	NII/TA	Diversification and business mix measure
Non-interest expense over total assets	NIE/TA	Management of expenses
Equity over total assets	EQ/TA	Capital strength measure
External variables		
Economic growth	GDP	Gross domestic product per capita
Inflation	INF	Annual inflation rate
The ratio of stock market capitalization	CAP	Financial development measure

In analyzing the factors affecting bank profitability, the following two general hypotheses were formed:

H_1: Bank-specific factors such as bank size (TA)**,** credit risk (nonperforming loans over total loans, NPL/TL)**,** capital strength (equity over total assets, EQ/TA)**,** income diversification (NII/TA), and expense management (NIE/TA) significantly affect the profitability of Turkish private deposit banks.

Based on the literature, larger banks (greater TA) are expected to be more profitable due to economies of scale. Moreover, higher capital strength is anticipated to have a positive relationship with profitability since well-capitalized banks are generally considered to be more stable and resilient. In contrast, a higher NPL/TL ratio, which represents credit risk, is expected to negatively impact profitability, as non-performing loans represent a loss for banks. The study posits that better income diversification and expense management are also likely to positively influence profitability.

H_2: Economic growth (GDP) and inflation (INF) are expected to positively affect the profitability of Turkish banks.

During periods of economic expansion, banks tend to perform better, with higher demand for loans and financial services. On the other hand, inflation may affect profitability in different ways: while moderate inflation could indicate a growing economy, high inflation is typically associated with higher operational costs and lower consumer purchasing power, which could harm profitability. Stock market capitalization (CAP), as a measure of financial development, is expected to have a less direct impact, though it may still be important for financial market stability and investor confidence.

4. EMPIRICAL FINDINGS

Table 3. Descriptive Statistics of Variables

	Mean	Standard Deviation	Minimum	Maximum
ROA	0.015	0.020	-0.115	0.137
ROE	0.108	0.294	-3.986	0.502
TA	17.434	1.792	13.470	21.621
NPL/TL	0.053	0.073	0.000	0.649
NII/TA	0.007	0.013	0.000	0.167
NIE/TA	0.022	0.014	0.005	0.158
EQ/TA	0.116	0.042	0.029	0.397
GDP	9.284	0.124	9.060	9.481
INF	21.024	21.664	7.490	72.310
CAP	26.586	.535	25.821	27.503

Descriptive statistics for the variables are computed panel level and the findings are displayed in Table 3. ROA mean is 0.15±0.020 with -0.115-0.137 range. ROE mean is 0.108±0.294 with -3.986-0.502 range. TA mean is 17.434±1.792, NPL/TL mean is 0.053±0.073, NII/TA mean is 0.007±0.013, NIE/TA mean is 0.022±0.014 and EQ/TA mean is 0.116±0.042. Although the GDP value follows a horizontal course over the time series, INF shows serious fluctuations over the years (Table 3).

Table 4. Correlation Matrix for the Explanatory Variables

Independent variables	ROA	ROE	TA	NPL/TL	NII/TA	NIE/TA	EQ/TA	GDP	INF	CAP
ROA	1	0.701**	0.180**	-0.300**	0.193**	-0.102	0.531**	0.163*	0.466**	-0.026
ROE	0.701**	1	0.229**	-0.246**	0.051	-0.136*	0.181**	0.159*	0.305**	0.027
TA	0.180**	0.229**	1	0.153*	-0.114	-0.356**	-0.297**	-0.041	0.273**	-0.061
NPL/TL	-0.300**	-0.246**	0.153*	1	-0.042	-0.090	-0.195**	-0.267**	0.041	-0.096
NII/TA	0.193**	0.051	-0.114	-0.042	1	0.221**	0.350**	0.040	0.017	-0.035
NIE/TA	-0.102	-0.136*	-0.356**	-0.090	0.221**	1	0.165*	.371**	-0.254**	0.117
EQ/TA	0.531**	0.181**	-.297**	-0.195**	0.350**	0.165*	1	0.022	-0.041	0.018
GDP	0.163*	0.159*	-0.041	-0.267**	0.040	0.371**	0.022	1	0.201**	0.106
INF	0.466**	0.305**	0.273**	0.041	0.017	-0.254**	-0.041	.201**	1	-0.120
CAP	-0.026	0.027	-0.061	-0.096	-0.035	0.117	0.018	0.106	-0.120	1

*p<0.05, **p<0.01

The correlation matrix for the explanatory variables is reported in Table 4. Correlation analysis provides information on the direction and size of the relationship between variables. ROA is significantly correlated with TA (r=0.180; p<0.01), NPL/TL (r=-0.300; p<0.01), NII/TA (r=0.193; p<0.01), EQ/TA (r=0.531; p<0.01), GDP (r=0.163; p<0.01) and INF (r=0.466; p<0.01). Based on these findings, we can infer that key variables such as bank size (TA), diversification (NII/TA), capital strength (EQ/TA), economic growth (GDP) and inflation (INF) affect the financial performance of commercial banks (ROA) in a significant and positive way. The correlation matrix shows a positive relationship between GDP and both ROA (0.163*) and ROE (0.159*), although the coefficients are relatively small. On the other hand, the management of credit risk (NPL/TL) is a factor that affects the bank profitability (ROA) in a significant and negative way.

In summary, ROE is significantly correlated with TA (r=0.229; p<0.01), NPL/TL (r=-0.246; p<0.01), NII/TA (r=0.193; p<0.01), EQ/TA (r=0.181; p<0.01), NIE/TA (r=-0.136; p<0.01), GDP (r=0.159; p<0.01) and INF (r=0.305; p<0.01). This means that the second dependent variable of ROE is significantly and positively affected by bank size (TA), diversification (NII/TA), capital strength (EQ/TA), economic growth (GDP) and inflation (INF). But, management of credit risk (NPL/TL) and management of expenses (NIE/TA) affect bank performance (ROE) significantly and in a negative way.

Table 5. Factors Affecting Turkish Deposit Banks' ROA and ROE

Regressions	ROA fixed	ROA random	ROE fixed	ROE random
Constant	-0.2084	-0.1483	-4.6801	-3.3065
		Bank characteristics		
TA	0.0049**	0.0032**	0.0716*	0.0405**
NPL/TL	-0.0509**	-0.0557**	-0.6599*	-0.9247**
NII/TA	-0.0557	-0.0290	-1.3597	0.0733
NIE/TA	-0.0521	-0.0537	-1.6550	-1.8697
EQ/TA	0.2986**	0.2866**	3.0662**	1.6008**
		Economic and Market Conditions		
GDP	0.0096	0.0065	0.2740	0.2052
INF	0.0003**	0.0004**	0.0023*	0.0030**
CAP	0.0004	0.0004	0.0253	0.0242
R^2	0.6014	0.6276	0.2224	0.2489
F-statistic	35.64		7.67	
Wald $\chi 2$		337.49		76.56
$\chi 2$		0.0000		0.0000
No. of observations		240		240
Haussman Test	X^2: 11.88	p: 0.1567 (Random)	X^2: 16.00	p: 0.0423 (Fixed)

*p<0.05, **p<0.01

According to the Hausmann test, the random model is valid for the ROA model (p>0.05). According to the random effect results of ROA panel data analysis, the effect of TA (B=0.0032; p<0.01), NPL/TL (B=-0.0557; p<0.01), EQ/TA (B=0.2866; p<0.01) and INF (B=0.0004; p<0.01) series on the ROA value of banks is statistically significant. The effect of bank size (TA), capital strength (EQ/TA) and inflation (INF) is positive, whereas the effect of credit risk (NPL/TL) is in negative way. The explanatory value of the model is 0.6276 meaning that the model explains 62.76% of total variance (Table 5).

According to the Hausmann test, the fixed model is valid for the ROE model (p<0.05). According to the random effect results of ROE panel data analysis, the effect of TA (B=0.0716; p<0.05), NPL/TL (B=-0.6599; p<0.05), EQ/TA (B=3.0662; p<0.01) and INF (B=0.0023; p<0.05) series on the ROA value of banks is statistically significant. That is, the effect of bank size (TA), capital strength (EQ/TA) and inflation (INF) are positive, whereas the effect of credit risk (NPL/TL) is in negative way. The explanatory value of the model is 0.2224 meaning that the model explains 22.24% of total variance (Table 5).

As stated earlier, ROA and ROE are the most commonly used independent variables in the literature for bank profitability. As emphasized by Turgutlu (2014), ROE gives the expected rate of return on a fixed investment based on the firm's past performance. This situation means that the ROE will diverge from the ROA in debt-dominated institutions. ROA measures how efficiently a company uses its assets to generate earnings, while ROE measures how much profit a company generates from shareholders' equity. ROA doesn't take into account financial leverage, while ROE increases with higher financial leverage. Goddard et al. (2004) stress that ROE is

a better measure of profitability than ROA, especially when off-balance sheet items have a significant contribution on bank profits. The findings stress that the random effect of ROA and fixed effect results for the ROE model are in the same direction as shown in Table 5.

Bank Size (TA): The positive relationship between bank size (TA) and profitability (both ROA and ROE) is consistent with previous studies, such as Topak & Talu (2017), Belke & Unal (2017), Adelopo et al. (2017), Turgutlu (2014), Dietrich & Wanzenried (2011) and Davydenko (2011), which suggest that larger banks benefit from economies of scale, leading to more efficient operations and, consequently, higher profitability. However, this study's results indicate that while bank size is positively correlated with profitability, the relationship is more pronounced with ROE (B = 0.0405 for ROE) than with ROA (B = 0.0032 for ROA), suggesting that larger banks in Türkiye are better able to generate profits from shareholder equity rather than from asset utilization. This finding is in line with Goddard et al. (2004)**,** who argue that ROE is a better indicator of profitability in institutions with high financial leverage, such as large banks.

Credit Risk (NPL/TL): The negative relationship between Non-Performing Loans (NPL) and bank profitability, predominantly in the form of ROA and ROE**,** aligns with the findings of studies such as Erdoğan (2024), Bayrakcı (2022), Topak & Talu (2017), Belke & Unal (2017), Ozcan (2017), Ozgur & Gorus (2016), Akbaş (2012), Alper & Anbar (2011), Ramadan et al. (2011), Sufian & Chong (2008) and Athanasoglou et al. (2005). High non-performing loans (NPLs) reduce a bank's ability to generate profits by increasing provision costs and impairing asset quality. Our results (B = -0.0557 for ROA and B = -0.9247 for ROE) strengthen this view, showing that Turkish banks with higher credit risk have significantly lower profitability. The more stringent management of credit risk, as suggested by Goddard et al. (2004)**,** is essential for maintaining profitability during periods of economic uncertainty.

Capital Strength (EQ/TA): Capital strength remains a critical factor in enhancing profitability. The results show a robust positive relationship between capital adequacy (measured as equity over total assets) and profitability, which is consistent with studies like Erdoğan (2024), Mashamba & Chikutuma (2023), Doğan &Yildiz (2023), Bayrakcı (2022), Demirhan (2013), Dietrich & Wanzenried (2011), Sufian & Chong (2008), Athanasoglou et al. (2005), Sayilgan & Yildirim (2009), Demirgüç-Kunt & Huizinga (1999) and Goddard et al. (2004). Banks with higher capital levels are better positioned to absorb shocks, invest in opportunities, and ensure long-term stability. A well-capitalized banks tend to outperform their peers in terms of profitability (B = 0.2866 for ROA and B = 1.6008 for ROE), which further confirms the findings of Turgutlu (2014)**,** who suggested that capital strength is a key driver of financial performance in Türkiye.

Expense Management (NIE/TA): Bal & Sönmezer (2022), suggest that efficient expense management correlates positively with profitability. Both ROA and ROE regressions reveal a negative association with non-interest expenses over total assets (NIE/TA), suggesting that poor management of operational costs reduces profitability. This is consistent with findings from Doğan &Yildiz (2023), Bouzgarrou et al. (2018)**,** Topak & Talu (2017), Belke & Unal (2017), Ozcan (2017), Davydenko (2011), Sufian & Chong (2008) and Athanasoglou et al. (2005)**,** who also find that high operating costs erode profit margins. Despite the prevailing view in the literature on this issue, the study found that expense management (NIE/TA) did not have a significant impact on profitability.

Macroeconomic Factors (INF-GDP-CAP): The researh findings (B = -0.0004 for ROA and B = -0.003 for ROE) support the view that inflation (INF) has a significant positive impact on profitability, indicating that banks are able to generate higher profits during inflationary periods. The effect of inflation on bank profitability is heavily debated in the literature. Some studies find a negative relationship between inflation and profitability (Bayrakcı, 2022; Demirhan, 2013; Akbaş, 2012; Sayilgan & Yildirim, 2009; Sufian & Chong, 2008), as rising costs may erode profit margins. Conversely, others suggest that banks can hedge against inflation through interest rate adjustments, benefiting from higher nominal returns (Doğan &Yildiz, 2013; Davydenko, 2011; Athanasoglou et al., 2005).

Most studies have found that economic growth (measured by GDP) has positive impact on bank profitability (Doğan &Yildiz, 2023; Büyükoğlu, 2023; Bayrakcı, 2022; Bal & Sönmezer, 2022; Davydenko, 2011; Dietrich & Wanzenried, 2011; Sayilgan & Yildirim, 2009). However, the expected positive relationship of economic growth (GDP) and stock market capitalization (CAP) was not statistically significant in explaining profitability for the analyzed period.

5. CONCLUSION AND DISCUSSION

The objective of this study is to analyze bank-specific and macroeconomic factors affecting bank performance of private deposit banks in Türkiye. Banks play a central role in financing economic activity and acting as financial intermediaries. Here, the banking sector is one of the core elements of economic growth. Therefore, analyzing the bank profitability factors and the other dynamics of the banking system is crucial for the smooth functioning of the financial system and the general well-being of the economy.

The article investigates the factors affecting the profitability of private deposit banks in Türkiye over the period 2012-2023, focusing on bank-specific and macroeconomic variables. The two main hypotheses explored in the study concern the impact of these variables on bank profitability, as measured by the return on assets (ROA) and return on equity (ROE). The average asset profitability ratio (ROA) and the average equity profitability ratio (ROE) are used as dependent profitability measures. Besides, there are five internal (bank size, nonperforming loans over total loans, non-interest income over total assets, non-interest expense over total assets, equity over total assets), and three external (gross domestic product per capita, annual inflation rate, the ratio of stock market capitalization) independent variables are used in the analysis.

The first hypothesis suggests that bank-specific factors such as bank size (TA)**,** credit risk (nonperforming loans over total loans, NPL/TL)**,** capital strength (equity over total assets, EQ/TA)**,** income diversification (NII/TA), and expense management (NIE/TA) significantly affect the profitability of Turkish private deposit banks. The study finds that bank size (TA), capital strength (EQ/TA), and nonperforming loans (NPL/TL) are indeed significant predictors of profitability. Larger banks tend to show better profitability, reflecting the advantage of economies of scale, while higher capital and lower NPL/TL ratios contribute positively to bank performance. Interestingly, while diversification (NII/TA) and expense management (NIE/TA) were expected to significantly impact profitability, but they were not found to have a strong effect in the analysis. This suggests that while these factors are important in theory, their role in determining profitability in the Turkish context may be less significant compared to other factors like bank size and credit risk.

The second hypothesis examines the impact of macroeconomic factors such as economic growth (GDP)**,** inflation (INF), and stock market capitalization (CAP) on bank profitability. The findings support the hypothesis that inflation (INF) has a significant positive impact on profitability, indicating that banks are able to generate higher profits during inflationary periods. However, the expected positive relationship between economic growth (GDP) and profitability was less pronounced, and the effect of stock market capitalization (CAP) was not statistically significant in explaining profitability.

In summary, the study's findings reveal that bank size, capital strength, and the level of nonperforming loans (credit risk) have a significant impact on the profitability of Turkish private deposit banks, with a positive influence from bank size and capital strength and a negative impact from nonperforming loans. Inflation also plays a key role in increasing profitability. However, other bank-specific factors such as diversification and expense management, as well as macroeconomic factors like economic growth and stock market capitalization, did not show strong or statistically significant effects. The findings align with and expand upon the existing literature, offering both confirmations and new insights.

The limitations of this study should be considered when interpreting our findings. In this study, except for public banks only private deposit banks are included in the analysis. Although an important role in the Turkish banking system, public banks are excluded as they work with different motives. Politically public benefit motive is more important than profitability in public banks.

In summary, the banking sector as a dominant in the Turkish financial system is of critical importance in terms of meeting financing requests and ensuring economic growth and financial stability by mediating investment financing. Therefore, we can conclude that this study contributes to the literature by providing empirical evidence on the factors affecting bank profitability in the Turkish context, especially for private deposit banks, and highlights the importance of managing credit risk, scaling up, and maintaining strong capital levels. How can Turkish banks better manage inflationary pressures and credit risk in a high inflationary environment to maintain or improve profitability, and what role do regulatory frameworks play in supporting these objectives? Comparing the effectiveness of internal management strategies versus external regulatory measures could provide valuable insights for policymakers and bank managers alike. In conclusion, the findings can guide bank management and policymakers in improving the financial performance and stability of banks in Türkiye.

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This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

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The entire research is written by the author.

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