

The Impact of Inflation on the Real Return on Equity in the Turkish Banking Sector: An ARDL Approach*

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ABSTRACT

This study examines the impact of inflation on the real return on equity (RROE) in the Turkish banking sector, emphasizing the sector's ability to sustain real profitability under inflationary conditions. Using quarterly data from 2005 to 2024, the analysis employs the Autoregressive Distributed Lag (ARDL) model, Bounds Testing, and the Error Correction Model (ECM) to capture both short- and long-run dynamics. The results reveal a statistically significant and negative relationship between inflation and RROE, suggesting that rising inflation erodes real profitability. The inverse relationship between inflation and RROE is primarily driven by the sector's inability to adjust its net interest margin in line with rising nominal deposit and loan rates. By focusing on real profitability rather than nominal indicators, this study offers a more accurate and policy-relevant perspective on bank performance under macroeconomic stress.

Keywords: Bank Profitability, Inflation, Return on Equity, Net Interest Margin.

JEL Classification: G18, G21

Enflasyonun Türk Bankacılık Sektörünün Reel Özkaynak Karlılığı Üzerindeki Etkisi: ARDL Yaklaşımı

ÖZET

Bu çalışma, enflasyonun Türk bankacılık sektöründe reel özkaynak kârlılığı (RROE) üzerindeki etkisini incelemekte ve sektörün enflasyonist koşullar altında reel kârlılığını sürdürebilme kapasitesine odaklanmaktadır. 2005–2024 dönemine ait üçer aylık veriler kullanılarak kısa ve uzun dönem ilişkileri ortaya koymak amacıyla Otoregresif Dağıtılmış Gecikmeler (ARDL) modeli, Sınır Testi ve Hata Düzeltme Modeli (ECM) uygulanmıştır. Bulgular, enflasyon ile RROE arasında istatistiksel olarak anlamlı ve negatif bir ilişki olduğunu ortaya koymaktadır; bu durum, artan enflasyonun reel kârlılığı aşındırdığını göstermektedir. Enflasyon ile reel kârlılık arasındaki ters yönlü ilişkinin temel nedeni, sektörün mevduat ve kredi faizlerinde yaşanan nominal artışlara paralel olarak net faiz marjını yeterince artıramamasıdır. Nominal göstergeler yerine reel kârlılığa odaklanan bu çalışma, makroekonomik baskı altında banka performansına dair daha doğru ve politika açısından anlamlı bir bakış açısı sunmaktadır.

Anahtar Kelimeler: Banka Karlılığı, Enflasyon, Özkaynak Karlılığı, Net Faiz Marjı.

JEL Sınıflandırması: G18, G21

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Makale Gönderim Tarihi: 13.08.2025, **Makale Kabul Tarihi:** 27.10.2025, **Makale Türü:** Araştırma Makalesi

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1. INTRODUCTION

Achieving and maintaining adequate profitability levels is crucial for banks from multiple perspectives. First and foremost, profitable banks that retain their earnings strengthen their capital base. A robust capital buffer helps absorb unexpected losses, mitigate risks, and sustain financial stability, thereby enhancing banks' resilience against economic downturns and shocks (Xu et al., 2019: 28-30). Loans constitute the primary instrument through which banks perform their financial intermediation functions and generate profits. The lending capacity of banks is directly tied to their equity levels, and the safest way to expand equity is through profitability. A healthy profit stream enables banks to extend more credit to the real sector and individuals, thereby stimulating economic activity. When banks are profitable, they are better positioned to assume credit risk—an essential component for fostering investment and employment (Oino, 2021: 9-15; Şahin, 2024). For publicly traded banks, profitability translates into higher dividends and capital gains, which in turn enhance shareholder returns and make banks more attractive to investors. This facilitates capital increases when needed and supports growth. High profitability and strong equity also ease access to funding from both wholesale and retail markets, while reducing funding costs (Buch, 2024). Regulatory authorities closely monitor bank profitability as an indicator of financial health. Profitable banks are better equipped to meet regulatory capital requirements and other prudential standards. Moreover, profitability plays a vital role in attracting and retaining high-quality personnel, expanding and preserving market share, and ensuring sustainable and sound growth.

Both high inflation and fluctuations in inflation levels over time complicate banks' ability to accurately price loans, assess risk, and manage their balance sheets effectively. Generally, higher inflation is expected to lead to increased prices for goods and services. It also tends to drive up interest rates, resulting in elevated revenues and costs. Depositors, aiming to preserve the purchasing power of their savings, will demand higher deposit rates. Anticipating an inflationary environment, banks tend to raise lending rates to secure higher returns. In response to inflationary pressures, central banks may also increase policy rates to curb credit creation. As borrowing becomes more expensive for customers, the demand for funds may decline. Ultimately, the impact of inflation on bank profitability depends on how

banks respond to inflationary developments. Therefore, the effect of inflation on bank profitability may be expected to be either positive or negative (Ariyadasa et al., 2016: 5-6).

The relationship between inflation and bank profitability largely hinges on banks' ability to anticipate inflationary trends and adjust both interest rates and non-interest income and expense structures accordingly. In other words, predictability plays a decisive role in shaping the impact of inflation on bank profits. If banks can accurately forecast inflationary trends, they may increase revenues faster than costs and achieve higher profits. Conversely, if banks fail to anticipate inflation developments and are unable to adjust interest rates in a timely manner or face regulatory constraints in doing so they may suffer from narrower margins and declining profitability (Farooq et al., 2021: 3; Yüksel et al., 2018: 7).

Rising interest rates driven by inflation tend to increase banks' interest income from loans, while simultaneously raising their funding costs. The net impact on a bank's interest margin and profitability depends on how swiftly and fully loan and deposit rates can be adjusted. Poor management of this adjustment process may adversely affect profitability. Like other businesses in the economy, banks face elevated operating costs due to inflation-induced increases in wages, rents, and similar expenses. On the other hand, their non-interest income also tends to rise. The trajectory of these two components over time can influence bank budgets and profitability in either a positive or negative direction (Bergant et al., 2025: 9).

In the Netherlands during the 1970s and 1980s, relatively high inflation ranging between 8% and 10% combined with rising interest rates, initially exerted downward pressure on net interest income and reduced the net interest margin (NIM). However, the sustained increase in interest rates eventually began to have a positive effect on NIM over time. The extent to which banks benefit from rising interest rates primarily depends on how quickly they can pass higher rates onto borrowers. It also depends on the degree to which they are compelled to raise deposit rates. Additionally, banks must consider the increase in risk premiums they face when sourcing funds from the market. When interest rates rise sharply in the short term, deposit rates may outpace loan rates, thereby compressing net interest income. Over time, banks that successfully adapt to elevated interest rates can reverse the negative impact on NIM and enhance profitability (De Nederlandsche Bank, 2022).

High inflation can impair borrowers' ability to repay their loans, thereby increasing the risk of credit defaults and non-performing loans for banks. As inflation leads to higher interest rates and elevated risk levels, banks tend to adopt a more risk-averse stance in their lending practices, becoming increasingly selective in extending credit (Agarwal and Baron, 2024: 5). Empirical studies also reflect that as inflation rates rise, frictions in the credit market intensify, and loans extended to the real sector are adversely affected by high inflation (Bilalli et al., 2024: 265- 271). This situation weakens the banking system's capacity to support economic activity. It may lead to reduced credit availability for businesses and individuals, thereby slowing down economic growth. As an indirect consequence, the banking sector may experience a decline in profitability.

Inflation directly affects the profitability of banks through the quality of their loan portfolios and the provisions they set aside. In a high-inflation environment, businesses may be unable to pass on cost increases in the form of higher prices, while wage earners' income growth may lag behind inflation, causing their purchasing power to decline. In such circumstances, an increase in interest rates, coupled with inflation, can lead to difficulties for businesses and fixed-income households in repaying their debts (Şahin, 2025). In the Netherlands, the high inflation and rising interest rates that followed the oil crises of the 1970s and 1980s led to economic contraction and increased unemployment. These developments also caused a deterioration in credit quality, higher provisioning levels, and a decline in bank profitability. (De Nederlandsche Bank, 2022).

Inflation also affects bank profitability through the investment portfolios held on their balance sheets. In addition to loans, banks hold various securities on their assets for purposes such as yield diversification and liquidity management. If inflation rises unexpectedly and triggers a sharp increase in interest rates, the value of fixed-income securities in a bank's portfolio declines, resulting in capital losses (Koch and MacDonald, 2015: 219-222; Rose and Hudgins, 2013: 225; Choudhry, 2007: 95).

As a result of the interaction between high inflation and elevated tax rates applied to nominally increased income, firms' incentives to invest in productive capital may be adversely affected (Feldstein, 1997: 126; Mishkin, 2008). This will have adverse consequences for both the banking sector and the broader economy. In the face of high

inflation, banks that fail to generate real profits may still be taxed on nominal earnings, which can weaken their capital structure and constrain their lending capacity. Due to reduced investment incentives, demand for bank credit may decline, leading to lower bank profitability. Moreover, banks' ability to channel collected funds into productive investment opportunities may deteriorate.

This study examines the impact of inflation in the Turkish economy on the banking sector's real return on equity (RROE) between 2005 and 2024. RROE is chosen as the dependent variable instead of nominal ROE due to Turkey's significant and adverse divergence from global inflation trends. According to inflation statistics published by the OECD on July 3, 2025, the Consumer Price Index (CPI) increased by 4.0% year-on-year across OECD countries as of May 2025, whereas the same index rose by 35.4% in Turkey. Turkey ranks first among OECD countries in terms of inflation rate by a wide margin. (OECD, 2025). In an economy experiencing such high inflation, nominal figures can cause misleading interpretations. It is considered that the inflation-adjusted real level of bank profitability provides a more accurate indicator of actual performance. Therefore, this study relies on the banking sector's RROE figures calculated using the Fisher Equation. This approach eliminates the distorting effect of high inflation, which inflates nominal return on equity and produces deceptive results. In addition to RROE, Net Interest Margin (NIM) and Capital Adequacy Ratio (CAR) are employed as independent control variables.

Understanding the factors that positively and negatively affect the profitability of the banking sector holds practical significance for the formulation of regulatory policies, the preservation of financial stability, and the sound management of banks. Such insights can lead to the development of effective policy designs and alternative perspectives that help banks maintain profitability while managing risks. By focusing on real return on equity rather than nominal indicators, the study contributes a more accurate and policy-relevant perspective to the literature on bank performance under macroeconomic stress. Furthermore, the integration of bank-specific internal variables—such as NIM and CAR—into the inflation-profitability nexus provides a nuanced understanding of how institutional factors mediate macroeconomic shocks.

The relationship between inflation and the nominal profitability of banks has been examined in financial literature. However, the impact of inflation on the RROE of the Turkish banking sector remains unexplored. As inflation accelerates, it becomes increasingly important to understand this relationship in order to assess the real performance of banks. The aim of this paper is to address the gap in the literature by investigating the impact of inflation on the real, inflation-adjusted profitability of Turkish banks.

The study adopts an analytical perspective and is structured into six sections to enhance conceptual clarity. Following the introduction, the second section presents a literature review. Empirical studies examining the impact of inflation on banking sector profitability are reviewed in chronological order, aiming to shed light on the topic by drawing on findings that emerged under diverse economic, historical, and local conditions. The third section is dedicated to the data and research methodology employed in the study. This section is crucial for laying the foundation of the analysis and detailing the sources and techniques used in data collection and evaluation. In the fourth section, the analytical findings are discussed in conjunction with previous research results, with emphasis on the potential reasons behind the observed outcomes. The fifth section offers recommendations for practitioners and policymakers based on sectoral insights. The article concludes with a general evaluation and a discussion of potential future research topics.

2. LITERATURE REVIEW

The relationship between inflation and bank profitability varies significantly across countries and individual banks. Both the economic conditions of countries and the managerial capabilities of banks play a decisive role in shaping outcomes. Consequently, the impact of inflation, alongside other external macroeconomic variables and internal bank specific factors on bank profitability has been widely examined in the financial literature.

Boyd and Champ (2003) argue that rising inflation harms the banking sector by reducing net interest margins, net profits, return on equity, and net value added in real terms. Two large-scale studies examining the relationship between inflation and bank profitability or net interest margins—one covering 1,400 banks across 72 countries, and the other including 1,165 banks from 47 countries—found that nominal profitability and net interest margins are

positively affected by inflation, whereas real margins are significantly and negatively impacted. In general, banks are unable to preserve their real profits against inflation, especially when inflation is relatively high. Although nominal profits tend to rise with inflation, this increase is not sufficient to maintain real profitability. As inflation accelerates, both bank profits and net interest margins decline in real terms.

According to the authors, the adverse effects of high inflation on banks operate through three distinct channels. First, banks that borrow short-term and lend long-term are temporarily affected by rising interest rates. Second, regulatory constraints on interest rate determination may prevent banks from responding to inflationary increases in a timely manner. Third, inflation reduces real interest rates, leading to credit rationing, which in turn diminishes business volume and profitability (Boyd and Champ, 2003, 44-45).

Md. Noman et al. (2015), in their study of 35 banks in the Bangladeshi banking sector over the period 2003–2013, identified a strong positive relationship between the inflation rate and return on assets (ROA). The authors emphasized that banks were able to enhance their profitability by accurately adjusting interest rates in line with future inflation expectations.

Gyamerah and Amoah (2015) investigated the profitability of the Ghanaian banking sector and identified a weak but positive relationship between inflation and bank profitability.

Islam and Nishiyama (2016) examined the determinants of bank profitability using data from 259 commercial banks across Bangladesh, India, Nepal, and Pakistan over the period 1997–2012. Their dynamic panel analysis revealed that inflation has a statistically significant and positive impact on bank profitability. The authors attribute this effect to an asymmetric information advantage: bank managers, unlike depositors, are better equipped to anticipate future inflationary trends, enabling them to adjust pricing and investment strategies accordingly. This informational edge contributes to enhanced profitability in South Asian banking markets.

Ariyadasa et al. (2016) examined data from the Sri Lankan banking sector covering the period 2006–2014. Their study found that inflation does not have a significant impact on banks' return on assets in the short run; however, it has a positive and significant effect in the long run.

Adu et al. (2016) evaluated the impact of inflation on the performance of the Ghanaian banking sector using data from 2004 to 2013. Their findings revealed that inflation positively affects both ROA and ROE up to a threshold of 15 percent; however, when inflation exceeds this level, it becomes detrimental to bank profitability.

Yüksel et al. (2018) investigated banking sector data from 13 countries established after the dissolution of the Soviet Union, covering the period 1996–2016, to identify the factors affecting profitability. Among the three macroeconomic variables considered, a positive and significant relationship was found between economic growth and banks' ROE. However, no significant relationship was identified between interest rates or inflation and bank profitability.

Korytowski (2018) conducted a study on 4,179 European banks covering the period 2011–2015 and identified a strong negative impact of inflation on bank profitability.

Jadah et al. (2020) examined bank-specific, macroeconomic, and managerial factors that may influence the profitability of the Iraqi banking sector. Among the macroeconomic variables, they hypothesized that inflation would enhance profitability due to rising interest rates. However, the results revealed the opposite, showing a strong negative correlation between inflation and bank profits.

Adelepo et al. (2021) examined the impact of capital and liquidity regulations introduced under Basel III on the profitability of European banks, while including economic growth and inflation as macroeconomic control variables in their analysis. Based on data from 28 countries covering the period 2010–2018, the study found no significant relationship between inflation and bank profitability. The authors interpreted the lack of sensitivity of bank profitability to inflationary trends as a positive outcome for financial stability.

Ozili (2021) evaluated the factors affecting the profitability of the banking sectors of the USA, South Africa and Nigeria, which are at different levels of financial development, using data from 1996-2017. The study found a positive and significant effect of inflation on ROA only in South Africa. No significant effect of inflation on profitability was determined in the USA and Nigeria.

Farooq et al. (2021) examined the impact of internal and external factors on the profitability of banks in the Pakistani banking sector over the period 2009–2018. Their study identified a negative relationship between inflation and bank profitability. This outcome was attributed to banks' inability to accurately forecast changes in the inflation rate, which in turn prevented them from appropriately adjusting interest rates.

Bayrakçı (2022) examined the factors affecting the profitability of the top ten banks in the Turkish banking sector based on asset size, using data from the period 2011–2020. The study found that inflation negatively affects both ROA and ROE to the same extent. The negative impact of inflation on profitability indicators was attributed to rising price levels and borrowing costs, financial uncertainty, dollarization, and the adverse effects of asset-liability mismatches.

Mashamba and Chikutuma (2023) conducted a panel data analysis based on information from 11 commercial banks operating in Zimbabwe during the period 2011–2020. Their study did not find convincing evidence to support the claim that inflation negatively affects bank profitability in Zimbabwe. The authors suggested that this may be due to the banks' ability to accurately forecast inflation and incorporate it into their interest rate-setting processes. The capacity to manage inflationary pressures and implement sound strategies has contributed to the resilience of Zimbabwean banks, allowing them to maintain profitability even under economic hardship.

Tomak (2024) evaluated the factors affecting ROA and ROE of 20 deposit banks in the Turkish banking sector using data from 2012 to 2023. The study found that inflation has a significant and positive impact on both types of profitability. It was noted that banks tend to achieve higher profitability ratios during inflationary periods.

Laporsek et al. (2025) examined bank-specific and macroeconomic factors affecting the profitability of 3,076 banks operating in 34 European countries during the period 2013–2018. The study found that inflation has a negative impact on bank profitability.

Following the accommodative monetary policies implemented during the COVID-19 pandemic, the subsequent surge in global inflation prompted international institutions to investigate the effects of inflation more closely. While previously, ultra-low interest rates had

raised concerns about banking sector profitability, the rapid rise in inflation and the resulting interest rate hikes by central banks have this time brought potential adverse effects on bank profitability and financial stability to the forefront. Among these studies is the International Monetary Fund's (IMF) *Inflation and Bank Profits: Monetary Policy Trade-offs*, which evaluates the impact of inflation and the associated tightening of monetary policy on bank profits, and offers forward-looking policy recommendations. (Bergant et al., 2025).

According to the report, inflation affects bank profits through both interest income and expenses, as well as non-interest income and expenses. Since net interest income accounts for a larger share of total profitability, interest-related activities play a decisive role in shaping the overall impact of inflation on bank performance. The outcome varies across countries and individual banks. Factors such as differences in risk management practices, business model choices, regulatory frameworks, and the level of competition in the sector can influence whether the impact is positive or negative. The adverse effect of tight monetary policies—implemented to combat inflation—on bank profits brings to light the trade-off between price stability and financial stability. In this context, the importance of strong supervision and oversight, sound risk management, transparency, and predictable monetary and credit policies becomes increasingly evident (Bergant et al., 2025: 2-3).

3. DATA AND METHODOLOGY

3.1 Data and Variables

In order to determine the impact of inflation on the profitability of the Turkish banking sector, the first stage of the analysis employs quarterly profitability and capital adequacy data for the sector obtained from the official website of the Banking Regulation and Supervision Agency (BRSA), covering the period from 2005 to 2024. Additionally, quarterly consumer price index (CPI) figures published by the Turkish Statistical Institute (TurkStat) are used.

In similar studies, linear regression analysis or the ARDL methodology is commonly adopted as the modelling framework, while ROA and ROE are typically used as the primary dependent variables representing bank profitability.

In recent years, off-balance sheet positions and non-interest income have played an increasingly significant role in bank profitability, leading to more frequent use of ROE figures

as a measure of performance. (Korytowski, 2018: 7). In light of the growing relevance of off-balance sheet activities and non-interest income, this study employs ROE as the primary indicator of sector-wide profitability.

In line with the conceptual framework outlined in the introduction, the sector's ROE figures have been adjusted for inflation using CPI, based on the Fisher Equation, in order to obtain real profitability measures. In high-inflation environments, investors demand additional returns to compensate for the loss in purchasing power. The Fisher Equation captures the relationship between nominal and real returns under inflationary conditions. It serves both *ex ante*, in estimating the inflation premium required by investors, and *ex post*, in evaluating the extent to which nominal returns reflect real gains and preserve purchasing power. This adjustment enables a more accurate assessment of banking sector profitability in real terms, particularly under volatile macroeconomic conditions.

The Fisher Equation is expressed as:

$$(1+i) = (1+r) (1+\pi)$$

i = Nominal interest rate (return), r = Real interest rate (return) and π = Expected or actual inflation rate

In economies with low inflation, the difference between nominal and real returns is minimal, allowing for the simplified approximation;

$$i \approx r + \pi$$

However, in high-inflation economies such as Turkey, the exact formulation is preferred when adjusting returns to reflect real profitability, as the approximation may lead to significant distortions (Mishkin, 2022: 128).

Two bank-specific independent variables that are considered to influence the sector's ROE have been included in the analysis: NIM and CAR. NIM, calculated as net interest income divided by average total assets, reflects the net interest earnings generated per unit of asset managed by the sector. It is one of the key indicators of how efficiently financial resources are utilized. CAR, on the other hand, is computed as the ratio of a bank's regulatory

capital to its risk-weighted assets, including credit, market, and operational risks. It serves as a critical measure of the banking system's financial soundness and its capacity to extend credit.

Table 1 presents the variables used in the analysis along with their abbreviations:

Table 1. Variables Used in the Analysis

Category	Qualification	Variable	Abbreviation
Dependent	Profitability	Real Return of Equity	RROE
Independent	Inflation	Consumer Price Inflation	CPI
Independent	Capital	Capital Adequacy Ratio	CAR
Independent	Earnings	Net Interest Margin	NIM

The descriptive statistics of the variables used in the study are crucial for understanding the content of the research. The presented values - particularly measures of central tendency (such as the mean or median) and dispersion (such as standard deviation or range) - provide insights into the fundamental structure and characteristics of the collected data.

The descriptive statistics for each variable are presented below in the Table 2.

Table 2. Descriptive Statistics

	RROE	CPI	NIM	CAR
Mean	2.341267	18.50488	4.154837	18.13295
Median	4.507097	9.855000	3.879460	17.87826
Maximum	18.65335	83.45000	6.460680	27.82861
Minimum	-24.67399	3.990000	2.842768	14.64436
Std. Dev.	9.876159	19.51187	0.804420	2.281462
Skewness	-0.858101	1.945159	0.809108	1.607627
Kurtosis	3.301861	5.540787	2.824695	6.699851
Observations	82	82	82	82

During the examined period, both RROE and CPI rate exhibited considerable variability, which is also reflected in their relatively high standard deviations. These are followed by the CAR, while NIM displayed comparatively lower volatility and a smaller standard deviation throughout the sample period. The fluctuations in inflation, particularly the sharp increase in recent years, are expected to have posed challenges for banks in managing their balance sheets.

The relationships among the variables used in the analysis are presented in the correlation matrix below in Table 3. This matrix serves as a preliminary diagnostic tool to assess the strength and direction of associations between variables, to inform the construction of regression models, and to detect any potential multicollinearity among the independent variables.

Table 3. Correlation Matrix

	RROE	CPI	NIM	CAR
RROE	1,0000	-0,8716	0,2712	0,1248
CPI	-0,8716	1,0000	0,0489	0,0397
NIM	0,2712	0,0489	1,0000	0,6694
CAR	0,1248	0,0397	0,6694	1,0000

The correlation matrix reveals a negative relationship between CPI and RROE, while a positive association is observed between CPI and NIM. RROE also shows a positive but weak correlation with CAR. These relationships may be considered as preliminary indicators for the current analysis. The negative correlation between CPI and RROE is consistent with findings from several studies in the literature. Similarly, the positive association between NIM and RROE aligns with theoretical expectations, suggesting that as NIM increases, the sector's RROE tends to rise.

Importantly, the correlation coefficients do not indicate any excessively strong relationships among the independent variables that would imply multicollinearity. This has been further verified using the Variance Inflation Factor (VIF) test. The calculated VIF values for CPI (1.0024), NIM (1.8133), and CAR (1.8118) confirm the absence of multicollinearity concerns.

3.2 Model Specification

The evaluation uses the Autoregressive Distributed Lag (ARDL) approach alongside the Bounds Testing procedure and the Error Correction Model. This method was selected because it can capture short-term dynamics and long-term relationships, accommodate variables with different levels of stationarity and deliver robust results even with small sample sizes.

Following the estimation of the impact of the selected independent variables on the dependent variable (ROE) through the ARDL approach, the underlying drivers of the results will be examined from an analytical perspective. In this context, sectoral NIM during the analysis period will be evaluated alongside the rising significance of non-interest income components, such as fees, commissions, and banking service revenues. Additionally, trends and shifts in operating expenses will be investigated to identify potential factors contributing to the ARDL findings and to provide a more comprehensive interpretation of the sector's profitability dynamics.

4. EMPIRICAL RESULTS AND ANALYSIS

4.1. ARDL Estimation, Bounds Testing, and Error Correction Analysis

In order to avoid spurious regression results, it is crucial to ensure that the financial time series used in the analysis are stationary, that is, they do not exhibit an unit root. As many such series are inherently non-stationary, differencing is commonly applied to achieve stationarity (Gujarati and Porter, 2009: 748; Sevüktekin and Çınar, 2017: 246, 324).

In this study, the Augmented Dickey-Fuller (ADF) unit root test was applied to examine the stationarity of the variables. The results in the Table 4 below show that RROE, NIM, and CAR are stationary in levels, while CPI exhibits a unit root and becomes stationary only after first differencing. In the Table 4, D(CPI) represents the first-differenced form of the CPI variable.

The stationarity of CPI at first difference was also confirmed by the Phillips-Perron (PP) test, which produced a test statistic of -5.551655 and a *p-value* of 0.0001 , providing strong evidence against the presence of a unit root.

Table 4. ADF Unit Root Test Statistics

	t-Statistic	Prob.
RROE	-4,6490	0,0017
D(CPI)	-3,5591	0,0403
NIM	-4,0985	0,0094
CAR	-4,4369	0,0034

When time series are differenced to achieve stationarity, short-run dynamics and long-run relationships may be lost. To identify long-run relationships among non-stationary series,

various modelling approaches and cointegration tests are employed, taking into account the order of integration at which stationarity is achieved (Sarikonavlık et al., 2020: 127). The ARDL approach is used in the study to capture these long-term relationships. The Bounds Testing procedure is applied to determine whether a cointegration relationship exists among the variables. If cointegration is detected, the Error Correction Model (ECM) is used to jointly estimate the short-run dynamics and the long-run equilibrium path.

The optimal lag lengths for the ARDL model were automatically determined using the Akaike Information Criterion (AIC) within the EViews statistical software package. AIC is widely preferred for its ability to select more precise models while minimizing the risk of omitted dynamics. It tends to retain sufficient lag structure to capture short-run adjustments and dynamic interactions among variables, thereby ensuring that the estimated long- and short-run relationships are robust. Moreover, using AIC enhances model reliability by balancing goodness of fit with model simplicity, reducing potential bias from underfitting or overfitting. Within this framework, the maximum lag length was set to 4, and ARDL(1,3,2,0) was selected as the appropriate model.

To investigate the presence of long-run relationships, the Bounds Test is conducted based on the ARDL model. The initial estimation results of this model are shown in the Table 5 below

Table 5. ARDL Initial Estimation Results

Dependent Variable: RROE				
Method: ARDL				
Sample: 2005Q4 2025Q2				
Included observations: 79				
Dependent lags: 4 (Automatic)				
Automatic-lag linear regressors (4 max. lags): CPE NIM CAR				
Huber-White-Hinkley (HC1) heteroskedasticity consistent standard errors and covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RROE(-1)	0,737593	0,076866	9,595853	0,000000 ***
CPE	-0,530568	0,040285	-13,170510	0,000000 ***
NIM	4,000209	0,762988	5,242818	0,000000 ***
CAR	0,149870	0,200038	0,749208	0,456300
C	-7,011507	2,822786	-2,483896	0,015400 **
R-squared	0,967127	Mean dependent var	2,159646	
Adjusted R-squared	0,962839	S.D. dependent var	10,005290	
F-statistic	225,552700	Durbin-Watson stat	1,995697	
Prob(F-statistic)	0,000000			
Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.				

Empirical results show a strong autoregressive structure in RROE, as evidenced by the coefficient of the lagged variable RROE(−1), which is 0.737593. This indicates that past values exert a significant positive influence on current outcomes. The finding that RROE is significantly affected by its own lagged values highlights the path-dependent nature of profitability in the banking sector. It indicates that past performance is not merely a reflection of historical conditions, but a key determinant of current and future returns as well as the sector's growth trajectory. This persistence underscores the importance of maintaining stable and resilient profitability patterns over time. Inflation exerts a negative influence on RROE, with a coefficient of −0.530568, whereas an increase in NIM contributes positively and significantly to profitability, as reflected in its coefficient of 4.000209. The p-values for these three variables suggest that the relationships are statistically significant at the 1% level. Although the coefficient for CAR is positive, it lacks statistical significance. While CAR plays a critical role in risk management and financial resilience, it does not appear to exert a meaningful effect on the profitability of the banking sector.

The bounds test conducted after the ARDL estimation produced an F-statistic of 5.658375. This value surpasses the 1% upper bound critical threshold of 5.092, providing strong evidence of a long-run cointegration relationship among RROE, CPI, and NIM.

Following the identification of a long-run cointegration relationship, ECM was employed to separately estimate the short-run and long-run dynamics. The results reflecting short-term dynamics are presented in the Table 6 below.

Table 6. Short-Term Dynamics Estimated via the Error Correction Model

Dependent Variable: D(RROE)					
Method: ARDL					
Sample: 2005Q4 2025Q2					
Included observations: 79					
Dependent lags: 4 (Automatic)					
Automatic-lag linear regressors (4 max. lags): CPI NIM CAR					
Huber-White-Hinkley (HC1) heteroskedasticity consistent standard errors					
and covariance					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
COINTEQ	-0,262407	0,047963	-5,471013	0,000000	***
D(CPI)	-0,530568	0,036343	-14,598800	0,000000	***
D(CPI(-1))	0,071498	0,041447	1,725043	0,088800	*
D(CPI(-2))	-0,099003	0,038379	-2,579616	0,011900	**
D(NIM)	4,000209	0,578134	6,919172	0,000000	***
D(NIM(-1))	-1,388502	0,566181	-2,452397	0,016600	**
R-squared	0,786905	Mean dependent var	-0,099918		
Adjusted R-squared	0,772309	S.D. dependent var	3,929738		
F-statistic	53,913910	Durbin-Watson stat	1,995697		
Prob(F-statistic)	0,000000				
Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.					

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The ECM results suggest that rising inflation in the current period (D(CPI)) exerts a negative impact on RROE, as evidenced by its coefficient of -0.530568. While the one-period lagged effect (D(CPI(-1))) is positive, but its significance is at the 10% level. The two-period lagged effect is again negative, reinforcing the adverse influence of inflation on profitability. NIM, on the other hand, contributes positively and significantly to RROE in the current period with a coefficient of 4.000209. The negative and relatively weak one-period lagged effect of NIM may reflect a post-margin expansion slowdown in credit demand and increased funding costs. Taken together, the short-run dynamics indicate that inflation has a strong and statistically significant negative effect on RROE, whereas NIM exerts a strong and significant positive influence. The CAR variable, previously found to be insignificant in the ARDL model, is excluded from the ECM specification.

The COINTEQ coefficient represents the error correction term, capturing the speed at which short-run deviations from the long-run equilibrium are adjusted. The negative and statistically significant COINTEQ coefficient of the model at the 1% significance level indicates that approximately 26% of short-run disequilibrium is corrected within one quarter, implying that full adjustment to the long-run equilibrium takes about one year.

The statistical significance of the model is supported by the F-statistic and its p-value. Furthermore, the R-squared and adjusted R-squared values indicate that the model successfully captures 78% and 77% of the short-run variation, respectively, underscoring its explanatory power.

The long-run estimation results of the model are presented in the Table 7 below.

Table 7. Long-term Estimation Results of Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CPI(-1)	-0,411252	0,046962	-8,757183	0,000000 ***
NIM(-1)	6,560442	1,690742	3,880215	0,000200 ***
CAR	0,571135	0,728242	0,784265	0,435400
C	-26,719990	10,674600	-2,503136	0,014500 **

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Based on this estimation, the ARDL equation is formed as follows:

$$RROE(-1) = -26,719991 - 0,411252 \text{ CPI}(-1) + 6,560442 \text{ NIM}(-1) + 0,571135 \text{ CAR}$$

The model's long-run findings indicate that inflation negatively affects the banking sector's real return on equity (RROE), with a coefficient of -0.4112252 , whereas NIM contributes positively and significantly, with a coefficient of 6.560442 . Both relationships are statistically significant at the 1% level. In practical terms, a one-unit increase in CPI reduces RROE by approximately 0.41 units, while an equivalent increase in NIM raises RROE by about 6.56 units over the long run. Inflation exerts a persistent adverse effect on real profitability. Although the sector attempts to offset this impact through lagged short-run adjustments, inflation continues to erode real returns over time. NIM, by contrast, consistently enhances sectoral profitability over the long term, reinforcing its role as a key performance driver. The CAR variable does not exhibit a statistically significant long-run relationship with RROE, echoing its limited influence observed in the short-run analysis.

Ultimately, the analysis demonstrates that inflation has a consistently negative effect on the Turkish banking sector's RROE, both in the short run and over the long term. Rising inflation rates diminish banks' profitability. As emphasized in prior research, the relationship between inflation and bank performance is context-dependent, varying across jurisdictions and institutional structures. While certain studies report a positive correlation, others document inflation's adverse impact. The findings of this study position the Turkish banking sector within the group of economies where inflation erodes real profitability.

The analysis reveals that NIM is positively and statistically significantly correlated with RROE. Higher NIM levels enhance banks' profitability in real terms. This result mirrors the conclusions of prior studies, reinforcing the notion that NIM plays a critical role in sustaining bank performance.

The negative relationship between inflation and banks' real return on equity (RROE) in both the short and long run can be attributed to lagged interest rate adjustments and the transmission of monetary policy. In the short term, nominal rigidities in loan and deposit contracts prevent banks from promptly repricing interest rates in response to rising inflation, thereby compressing net interest margins and reducing real profitability. As monetary authorities respond to inflation by raising policy rates, banks encounter higher funding costs and weaker loan demand, further depressing returns.

Over the longer term, persistent inflation erodes the real value of equity by lowering RROE, increasing interest rate and credit risk, elevating operating costs, and amplifying macro-financial uncertainty—all of which constrain sustainable profitability. Thus, the adverse effects observed in both the short and long run reflect how inflation distorts pricing mechanisms, cost structures, and risk conditions within the banking sector.

The robustness of the ARDL model results was assessed through several diagnostic tests. Autocorrelation was examined using the Durbin-Watson statistic, which yielded a value of 1.995697, indicating no autocorrelation. Similarly, the Breusch-Godfrey test produced an F-statistic of 0.9814, further confirming the absence of autocorrelation.

The Breusch-Pagan-Godfrey test indicated potential heteroskedasticity ($F = 2.718879$, $p = 0.0090$); however, the use of Huber–White–Hinkley (HC1) robust standard errors during model estimation effectively neutralized its influence on the statistical significance of the coefficients.

Moreover, the Jarque-Bera test (statistic = 2.8959, $p = 0.2351$) confirmed that the residuals follow a normal distribution, supporting the model's validity.

4.2. Interpreting the Drivers of the Estimated Relationships

Following the empirical finding that RROE in the Turkish banking sector is negatively and statistically significantly affected by inflation, the potential underlying causes of this result will be examined.

Bank profitability consists of two main components. The first is NIM, which essentially reflects the difference between the interest banks pay on the funds they collect and the interest they earn from loans and other interest-bearing assets. The second component comprises non-interest income and operating expenses. Non-interest income primarily stems from fees and commissions generated through various banking services, while operating expenses largely consist of personnel costs, rent, infrastructure, and other administrative expenditures. Banks achieve higher profitability to the extent that they can expand their net interest margins and generate fee and commission income that exceeds their operating costs.

Table 8 presents data on the non-interest income and operating expenses to total sector assets (NII_TA and OE_TA), the relative evolution of these two indicators (NII_TA/OE_TA), NIM, RROE, and CPI figures for the period between 2005 and 2024.

Table 8. Selected Financial Ratios and CPI Trends in the Turkish Banking Sector

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
NII_TA (I)	1,94	1,90	1,94	1,91	1,80	1,60	1,50	1,50	1,46	1,39	1,25	1,21	1,21	1,30	1,56	1,07	1,23	1,48	2,27	3,28
OE_TA (II)	3,50	3,08	3,01	3,04	2,73	2,63	2,31	2,35	2,28	2,11	1,98	1,90	1,80	1,67	1,77	1,59	1,51	1,73	2,38	2,70
I/II	55,38	61,84	64,30	62,81	65,93	60,89	64,97	63,96	63,87	65,69	63,42	63,67	67,27	77,95	88,05	67,11	81,38	85,07	95,54	121,35
NIM	5,39	4,85	4,88	4,72	5,44	4,30	3,46	4,07	3,72	3,53	3,45	3,65	3,77	3,91	3,85	3,91	3,76	6,46	3,80	3,49
RROE	4,10	10,36	15,11	7,89	15,38	12,89	4,55	8,97	6,33	3,77	2,27	5,29	3,54	-4,54	-0,32	-2,83	-15,14	-8,73	-13,42	-9,63
CPI	7,72	9,65	8,39	10,06	6,53	6,40	10,45	6,16	7,40	8,17	8,81	8,53	11,92	20,30	11,84	14,60	36,08	64,27	64,77	44,38

An increase in NIM indicates that banks have enhanced their efficiency in mobilizing funds and allocating them as loans. In other words, it reflects a higher net interest income per unit of average assets. As highlighted in the literature review, rising inflation typically leads to increases in both lending and deposit rates, and a relative increase in NIM is also expected under such conditions. From a theoretical standpoint, it is assumed that banks tend to widen their interest margins in inflationary environments to preserve profitability.

Meanwhile, the NII_TA/OE_TA ratio captures the evolution of the banking sector's ability to cover operational expenses through non-interest income over time. An upward trend in this ratio suggests that banks are expanding their non-interest income at a faster pace than their operating costs, thereby improving their efficiency in managing non-interest income and expenses. Theoretically, this dynamic is expected to contribute positively to bank profitability.

Figure 1 illustrates the comparative trends of the NII_TA/OE_TA ratio, NIM, and CPI in the Turkish banking sector across the observed years.

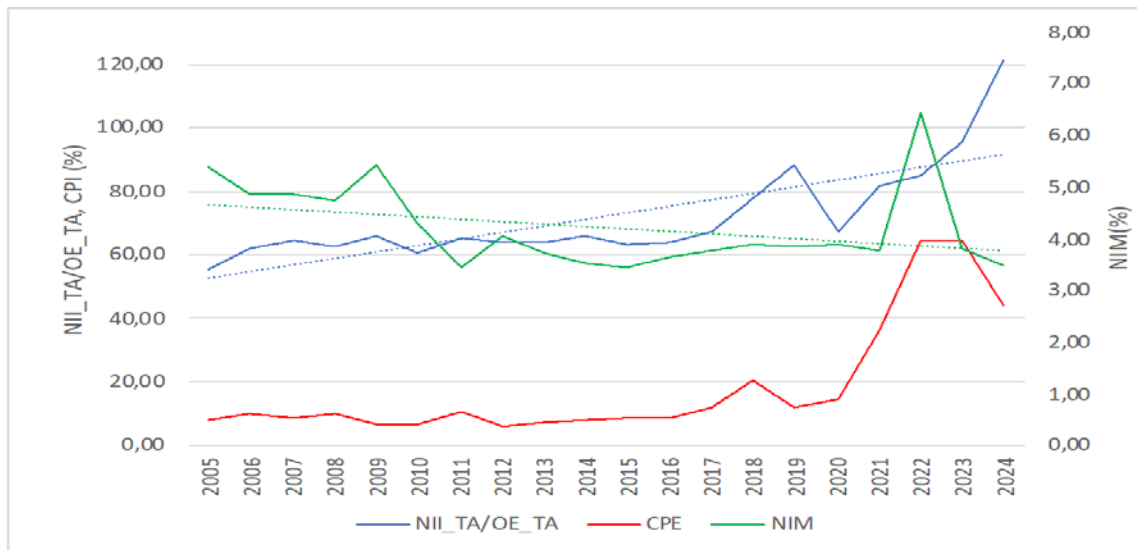


Figure 1. Key Components of Profitability and Inflation of Turkish Banking Sector

Source: BRSA and TURKSTAT data and author's calculations

During the period under review, the NIM of the Turkish banking sector exhibited a generally declining trend. This trajectory is illustrated by the dashed green line in the figure, which slopes downward. A notable exception to this trend occurred following September 2021, when inflation began to accelerate and the Central Bank of the Republic of Turkey (CBRT) initiated a monetary easing cycle by lowering its one-week repo rate, the main policy instrument. On 24 September 2021, the CBRT reduced the policy rate from 19% to 18%, marking the beginning of a rate-cutting process that concluded on 24 February 2023 with a rate of 8.50%. The banking sector benefited significantly from the decline in policy and market interest rates. By the end of 2022, the NIM had reached 6.46%, the highest level in the past two decades (CBRT, 2025).

Excluding this exceptional surge, the NIM has followed a downward trajectory throughout the period, remaining below the twenty-year average of 4.22% particularly over the last decade. Despite rising inflation and interest rates, the decline in NIM persisted beyond 2022, as depicted by the dashed green line in the figure. Therefore, the inability of the sector to sustain or improve NIM in an inflationary environment appears to be a key factor behind the decline in RROE.

The Turkish banking sector has demonstrated a strong performance in managing non-interest income particularly fees and commissions and operational expenses, which constitute

the second major component of profitability. Throughout the period under review, the ratio of NII_TA increased at a faster pace than the ratio of OE_TA. By the end of 2023, the two ratios converged, and in 2024, non-interest income surpassed operational expenses, thereby contributing positively to overall profitability. This development suggests that, in the face of rising inflation and a stagnant NIM, the sector has increasingly prioritized the management of non-interest income and expenses as a means of sustaining profitability—a trend illustrated by the blue dashed line in the Figure 1. While this strategy has yielded notable success, it has not been sufficient to offset the decline in RROE.

To enhance the analytical depth of the study, the trajectories of NIM and NII_TA/OE_TA during the analysis period have also been evaluated across ownership groups—namely private, foreign, and state-owned banks.

Table 9 reveals that foreign-owned banks maintained superior NIM performance during most of the research period, with an average of 5.08%. Private banks ranked second, averaging 4.22%, while state-owned banks underperformed relative to both groups, particularly after 2018. Their average NIM stood at 3.89% over the analysis period.

Table 9. Annual NIM values Across Ownership Groups

NIM	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Sector	5,39	4,85	4,88	4,72	5,44	4,30	3,46	4,07	3,72	3,53	3,45	3,65	3,77	3,91	3,85	3,91	3,76	6,46	3,80	3,49
Privat	5,63	4,48	4,56	4,29	5,19	4,11	3,24	3,72	3,49	3,49	3,37	3,49	3,67	4,16	4,33	4,63	4,31	7,50	4,22	2,74
State	4,62	4,86	4,67	4,36	5,12	3,97	3,34	4,20	3,92	3,39	3,28	3,68	3,51	3,33	3,25	3,51	3,09	6,02	2,93	2,73
Foreign	6,10	5,73	6,11	6,19	7,00	5,81	4,35	5,21	4,27	4,09	3,84	3,99	4,41	4,64	4,53	4,54	4,79	6,90	4,28	4,79

As shown in Figure 2 below, the negative trend in sectoral NIM was consistently reflected across all ownership segments.

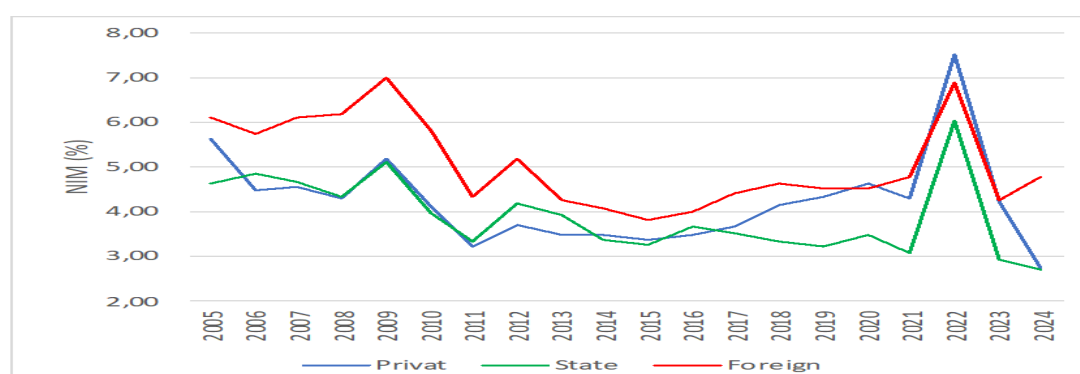


Figure 2. Annual Evolution of Net Interest Margin (NIM) by Ownership Group
Source: BRSA and TURKSTAT data and author's calculations

Table 10 below highlight a significant positive trend in the NII_TA/OE_TA dynamics across bank ownership groups. Since 2021, amid rising inflation, all three groups have shown marked improvement in covering operational expenses through non-interest income. Foreign banks led with an average ratio of 98.59%, followed by state-owned banks at 91.06% and private banks at 89.77%. In 2024, each group's NII exceeded its OE, signalling a net contribution to profitability.

Table 10. Comparative NII_TA/OE_TA Ratios Across Bank Ownership Groups

NII_TA/OE_TA	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Sector	55,38	61,84	64,30	62,81	65,93	60,89	64,97	63,96	63,87	65,69	63,42	63,67	67,27	77,95	88,05	67,11	81,38	85,07	95,54	121,35
Private	60,40	69,34	71,68	69,45	75,58	70,50	73,05	72,28	75,27	77,68	73,36	72,02	73,73	85,21	92,00	69,98	83,58	81,09	94,30	119,91
State	44,60	55,99	55,00	53,15	52,97	47,27	51,05	49,84	50,59	52,90	52,76	55,53	59,83	69,21	88,63	64,90	79,82	94,56	91,96	124,06
Foreign	44,29	48,11	53,90	55,13	57,41	53,44	61,39	61,83	56,53	60,35	65,19	65,30	71,54	84,10	94,22	70,63	86,56	86,63	107,00	142,12

As shown in Figure 3, all three banking groups appear to have undergone a strategic shift toward strengthening non-interest income streams, aiming to counterbalance the deteriorating NIM performance.

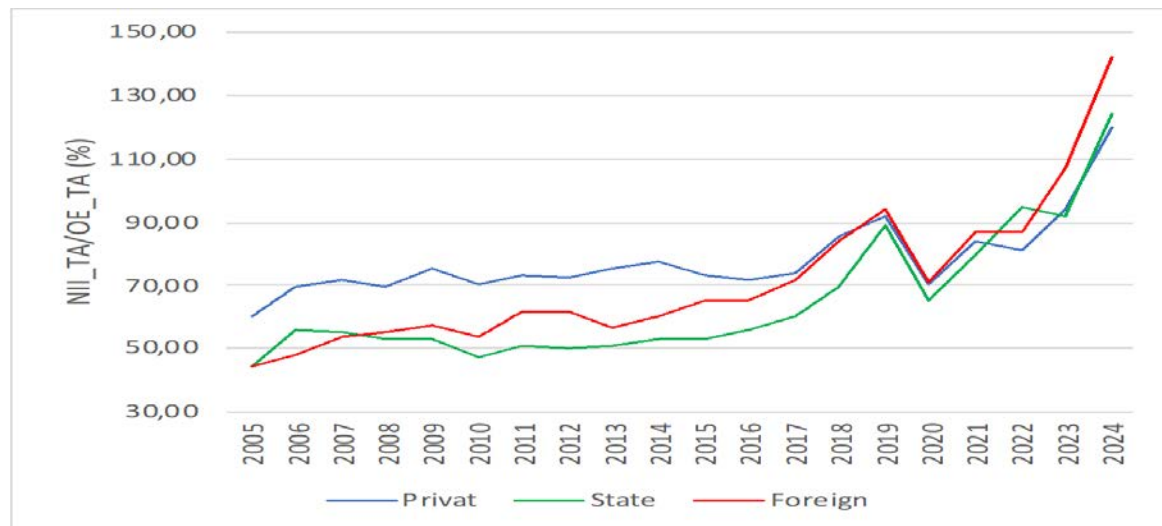


Figure 3. Annual Trend of NII_TA/OE_TA by Ownership Group

Source: BRSA and TURKSTAT data and author's calculations

Figure 4 below examines the evolution of RROE values for the three banking groups over time, in relation to changes in the CPI. The figure clearly demonstrates that, amid rising inflation, all three groups entered negative RROE territory. Since 2018, state-owned banks have exhibited the weakest RROE performance, significantly dragging down overall sector profitability. This outcome aligns with their persistently low NIM levels.

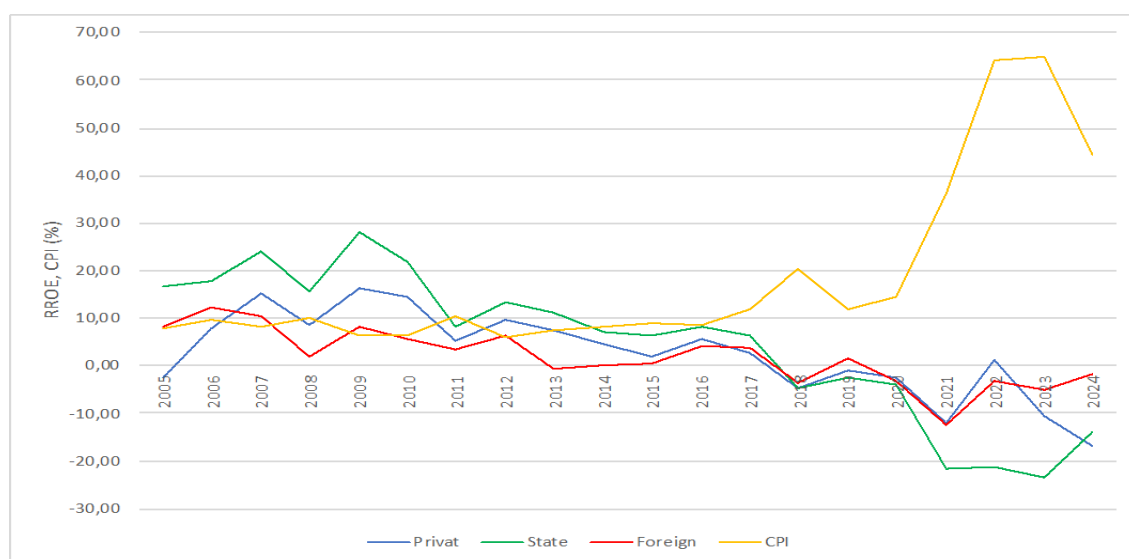


Figure 4. RROE Trends of Banking Groups in Relation to CPI

Source: BRSA and TURKSTAT data and author's calculations

Considering the high-inflation period of the past five years, foreign-owned banks have shown relatively stronger performance, with an average RROE of -5.24% , compared to -8.18% for privately-owned banks and -16.81% for state-owned banks. These results are consistent with the respective NIM and NII_TA/OE_TA figures observed across the groups.

5. DISCUSSION AND POLICY IMPLICATIONS

Inflation refers to the sustained and widespread increase in the general price level of goods and services over time. As highlighted in the literature, high inflation gives rise to various frictions and inefficiencies that hinder the effective and productive functioning of financial markets and by extension, the banking sector. Transaction costs increase, elevated interest rates lead to more expensive credit, and price signals become distorted. These dynamics complicate decision-making for both lenders and borrowers, disrupt resource allocation, and prevent credit from flowing to the most productive investments. Access to finance becomes more constrained for small enterprises and households, while heightened uncertainty discourages long-term investment planning. In high-inflation environments, these frictions become more pronounced: distinguishing between real and nominal values becomes increasingly difficult, expectations are destabilized, and volatility in interest rates amplifies overall risk and uncertainty (Alimi, 2014: 56; Bittencourt, 2011: 97-98).

Historically, inflation in Turkey has remained elevated compared to both advanced and emerging economies. Following the 2001 financial crisis, a series of monetary and fiscal reforms, along with structural adjustments, led to a significant decline in inflation, reaching its lowest level of 6.16% by the end of 2012. However, inflation resumed its upward trajectory in subsequent years, rising to 14.60% in 2020. In 2021, while inflation was already on the rise, the CBRT initiated a policy rate reduction cycle, which accelerated inflation further—culminating in a peak of 64.77% by the end of 2023.

Inflation adversely affects nearly all aspects of the economy and society, from economic growth and income distribution to resource allocation and productivity. The banking sector is no exception. This study aims to examine the impact of rising inflation on the Turkish banking sector. The analysis reveals that rising inflation reduced the sector's RROE. This adverse effect is primarily attributed to the sector's inability to improve its NIM despite rising interest rates.

In contrast, the sector has shown strong performance in managing non-interest income and expenses in recent years. This success has partially offset the negative impact of weak NIM dynamics. Nevertheless, given the dominant role of net interest income in determining bank profitability, the inability to enhance NIM in an inflationary environment has led to a decline in RROE.

Rising inflation undermines banks' real profitability, thereby constraining their growth potential and limiting their capacity to extend credit. This, in turn hampers one of the core functions of the banking sector efficiently channelling funds from savers to investors and facilitating optimal resource allocation ultimately exerting a restrictive influence on overall economic growth.

Banks' ability to expand their assets and loan portfolios depends on retaining earnings through self-financing mechanisms, thereby strengthening their equity base. When banks achieve a ROE that exceeds the inflation rate, they can grow their equity in real terms and, in turn, expand credit provision—facilitating greater resource allocation to the economy. Accordingly, maintaining inflation at reasonable levels is essential for the efficient and productive functioning of the banking sector.

A key strategy in combating inflation is to avoid economic policies that may trigger inflationary pressures. Once inflation reaches elevated levels, it becomes increasingly difficult to reduce, and the economic and social costs of disinflation rise substantially. In this context, consistent and credible monetary policies that prioritize price stability are indispensable for ensuring the sustainable growth of the banking sector.

As noted in the introduction, studies on bank profitability in inflationary environments emphasize the critical role of effective NIM management. Banks that can accurately anticipate future changes in inflation and interest rates and adjust their funding and lending rates accordingly are better positioned to maintain and enhance profitability.

In Turkey, particularly during the period of rapidly rising inflation between 2021 and 2024, banks struggled to manage their NIM effectively. Despite increases in nominal interest rates, they were unable to expand their net interest margins. This shortfall may be attributed to macroprudential measures that involved direct regulatory interventions outside the conventional market mechanisms. For instance, to curb the inflationary impact of credit expansion following policy rate cuts, certain types of cash loans were subjected to reserve requirements (T.C.M.B., 2022a); reserve requirements were substituted with government securities; commercial loan interest rates were capped relative to the policy rate; and loans exceeding the cap triggered mandatory security holdings (T.C.M.B., 2022b). These interventions significantly constrained banks' ability to manage interest rate spreads. The anchoring of loan interest rates to the policy rate has also posed an additional challenge for banks with varying funding and cost structures.

Figure 5 below illustrates the evolution of policy rate of CBRT (CBPR), three-month Turkish Lira (TL) deposit rates, TL dominated commercial loan rates, NIM and CPI. The figure distinguishes between the period prior to Q3 2021 characterized by relatively moderate inflation and the subsequent phase marked by high inflation following the CBRT policy rate cuts.

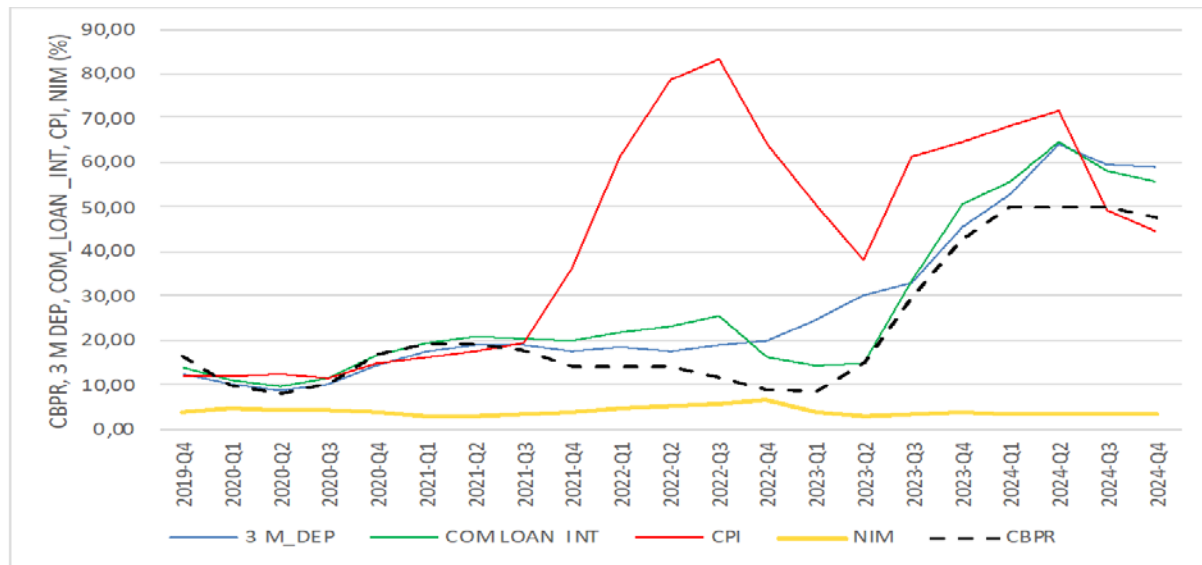


Figure 5. Trends in CBPR, Deposit and Commercial Loan Interest Rates in TL, NIM, and CPI between 2019-2024

Source: BRSA, TURKSTAT and CBRT data

The anchoring of loan interest rates to CBPR, which remained lower than the official inflation rate, combined with restrictive macroprudential measures, kept both deposit and lending rates substantially below inflation until Q2 2024. Between Q4 2022 and Q3 2023, commercial loan rates even remained below short-term deposit rates. Under these conditions, the banking sector was largely unable to enhance its NIM, aside from a temporary exception at the end of 2022. The persistence of this trend is evident in the relatively flat movement of NIM over the high inflation period, as illustrated by the yellow line in the Figure 5.

Similarly, the implementation of the Asset Ratio regulation, designed to incentivize credit growth, constituted a direct intervention in banks' asset and liability management decisions, further limiting the sector's operational flexibility (B.D.D.K., 2020; Ozatay, 2020: 281).

Avoiding macroprudential policy interventions that undermine banks' ability to manage net interest margins will help mitigate the adverse effects of inflation on the financial structure of the banking sector.

The adverse impact of inflation on banks' real profitability and consequently on their equity is further exacerbated by the exclusion of banks from inflation accounting practices. As of the end of 2023, Turkey adopted inflation accounting with the aim of adjusting financial

statements that no longer reflect the true financial position of firms due to changes in the purchasing power of money. This adjustment enables firms to be taxed not on inflated nominal profits, but on inflation-adjusted real earnings.

The Banking Regulation and Supervision Agency (BRSA) mandated the adoption of inflation accounting for banks as of January 1, 2025 (B.D.D.K., 2024a), but later revoked this decision with a subsequent resolution dated December 5, 2024 (B.D.D.K., 2024b). Moreover, Law No. 7491 stipulates that, even if banks apply inflation accounting, the profit or loss differentials arising from inflation adjustments shall not be considered in the determination of taxable income for the 2024 and 2025 fiscal periods. While taxing banks based on nominal profits inflated by high inflation may help preserve public tax revenues in the short term, it risks eroding banks' equity bases over the medium to long term, thereby constraining their operational capacity.

In this context, extending inflation accounting practices to banks, in line with the treatment of non-financial corporations, would contribute to the preservation of financial resilience within the sector and support the sustainability of long-term credit supply.

In the final quarter of the 2005–2024 analysis period, a sharp rise in inflation was accompanied by a significant expansion in credit. During this quarter, the annual average growth rate of loans reached 43.58%, while the average CPI rose by 44.82%. In comparison, the corresponding figures for the preceding five-year period were 16.50% and 12.28%, respectively. During this period, the rapid credit expansion was accompanied by a decline in the non-performing loan (NPL) ratio from 4.08% to 1.78%. However, as loan portfolios age, the probability of default tends to increase and rapid credit expansion is often followed by deterioration in credit quality (Salas et al., 2024: 2696-2712). Consequently, a lagged increase in NPL ratios is typically observed following periods of accelerated credit growth. If inflation remains elevated in 2025 and beyond, an increase in NPLs may occur, potentially undermining both nominal and real profitability in the banking sector. This issue is significant enough to warrant a dedicated research agenda. It would also be prudent for the sector to incorporate this risk into its credit risk management framework.

6. CONCLUSION

High inflation negatively affects nearly all aspects of economic and social life, and the banking sector is no exception.

This study aims to examine the short- and long-run effects of inflation on RROE in the Turkish banking sector. By focusing on real profitability rather than nominal indicators, the analysis provides a more accurate assessment of the sector's performance under inflationary conditions.

The findings reveal a statistically significant and negative relationship between inflation and RROE in both the short and long run. As inflation rises, the sector's RROE tends to decline. In contrast, NIM exhibits a strong, positive, and significant relationship with RROE across both time horizons, suggesting that margin expansion contributes directly to improved real profitability.

The primary driver of the inverse relationship between inflation and RROE is the sector's inability to increase its NIM in tandem with rising deposit and loan interest rates. However, the sector has recently demonstrated strong performance in generating non-interest income, which has increasingly supported profitability. These revenues have partially offset the adverse impact of stagnant margins, enhancing the sector's overall earnings capacity.

Real profitability is a prerequisite for the banking sector to perform its financial intermediation function in a healthy and sustainable manner. It enables banks to grow their equity base, expand their assets, increase credit supply, and ultimately support economic growth. In this context, combating inflation, which has wide-ranging negative effects on both the economy and the banking sector, is of critical importance.

This study presents valuable insights into the relationship between inflation and banking sector profitability in Turkey; however, several limitations should be acknowledged. First, the macro-level perspective adopted inevitably entails a degree of generalization. Although ownership structure has been considered, the sector does not exhibit a homogeneous profile at the level of individual institutions. Even within the same ownership group or segment, banks may diverge significantly in terms of NIM, non-interest income generation,

and operational cost management. Moreover, the practices of state-owned banks often deviate from market principles and can substantially influence sector-wide indicators due to their large market share. Future research employing panel data techniques to compare individual bank performance would offer a more nuanced understanding of these dynamics.

Furthermore, while inflation is modelled as an exogenous factor in this study, the banking sector may also contribute to inflationary pressures through credit expansion and interest rate transmission channels. This potential endogeneity constitutes a limitation and paves the way for further empirical investigation.

Another limitation stems from the high degree of correlation frequently observed among time series of economic and financial variables subject to similar macroeconomic conditions. This issue, commonly referred to as multicollinearity, is clearly evident in the movement of variables such as exchange rates and interest rates with the CPI, which is the model's main independent variable. Consequently, these variables were not included in the analysis to avoid distortion in the estimation process.

Building on these considerations, future research may explore several complementary dimensions: the underlying reasons behind the sector's limited success in managing NIM; the relationship between exchange rates, interest rates, non-performing loans and profitability; the impact of macroprudential measures on bank performance; the differential profitability responses of banks with varying ownership structures; and whether individual banks diverge in their ability to manage profitability under inflationary conditions—and if so, what underlying factors account for these differences.

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