DETERMINING THE FACTORS AFFECTING THE PROFITABILITY OF BANKS IN TÜRKİYE BETWEEN 2010 AND 2024

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DETERMINING THE FACTORS AFFECTING THE PROFITABILITY OF BANKS IN TÜRKİYE BETWEEN 2010 AND 2024

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ABSTRACT

In this study, the factors influencing bank profitability are examined using the panel data analysis method. The analysis is based on quarterly data covering the period from 2010 to 2024. Deposit banks in Türkiye are classified based on ownership structures, whereas participation banks are included without such classification due to their limited number in the sector. Profitability is measured using Return on Assets, Return on Equity, and Net Interest Margin. The independent variables used in the models are inflation, real interest rate, Gross Domestic Product, the ratio of Non-Performing Loans to Total Cash Loans, the ratio of Total Non-Interest Income to Total Non-Interest Expenses, and the ratio of Interest Expenses to Average Interest-Bearing Liabilities. The results indicate that inflation, real interest rate, Gross Domestic Product, the ratio of Non-Interest Income to Non-Interest Expense, and the ratio of Interest Expenses to Average Interest-Bearing Liabilities have significant effects on bank profitability.

Keywords: Banking; Profitability; Inflation; Real Interest Rates; Panel Data Analysis

ÖZ

Bu çalışmada, panel veri analizi yöntemi kullanılarak bankaların kârlılığını etkileyen faktörler araştırılmaktadır. Çalışmada çeyreklik veriler kullanılmış olup, Türkiye'de 2010-2024 yılları arasında faaliyet gösteren mevduat bankaları sahiplik yapılarına göre gruplandırılmış; katılım bankaları ise sektördeki sayılarının az olması nedeniyle sahiplik yapıları ayırt edilmeksizin analize dahil edilmiştir. Karlılık ölçütü olarak Aktif Karlılığı, Özkaynak Karlılığı ve Net Faiz Marjı oranları kullanılmıştır. Açıklayıcı değişkenler olarak ise; makroekonomik göstergelerden enflasyon, reel faiz oranı ve gayri safi yurtiçi hasıla; bankalara özgü finansal rasyolardan ise Brüt Takipteki Krediler / Nakdi Krediler rasyosu, Faiz Dışı Gelir / Faiz Dışı Gider rasyosu ve Faiz Giderleri / Ortalama Faiz Maliyetli Pasifler rasyosu dikkate alınmıştır. Elde edilen sonuçlara göre; enflasyon, reel faiz, GSYH, Faiz Dışı Gelir/Faiz Dışı Gider oranı ve Faiz Gideri/ Ortalama Faiz Maliyetli Pasifler oranı ile bağımsız değişkenlerin, bankaların karlılığı üzerinde anlamlı etkilerinin olduğu tespit edilmiştir.

Anahtar Kelimeler: Bankacılık; Karlılık; Enflasyon; Reel Faiz; Panel Veri Analizi

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADF:	Augmented Dickey-Fuller Test
ARDL:	Autoregressive Distributed Lag
BRSA (BDDK):	Banking Regulation and Supervision Agency
CBRT:	Central Bank of the Republic of Türkiye
CPI:	Consumer Price Index
EFT:	Electronic Funds Transfer
GDP:	Gross Domestic Product
GNAT:	Great National Assembly of Türkiye
IEXLC:	Interest Expenses / Interest-Bearing Liabilities
INR:	Real Interest Rates
MINF:	Inflation
NINEX:	Non-Interest Income / Non-Interest Expense
NIM:	Net Interest Margin
NPL:	Non-Performing Loans
ROA:	Return on Asset
ROE:	Return on Equity
SDIF:	Savings Deposit Insurance Fund
SME:	Small and Medium-Sized Enterprises

TBB:	The Bank Association of Türkiye
TSI:	Turkish Statistical Institute
TSKB:	Industrial Development Bank of Türkiye

INTRODUCTION

The banking sector has always been important to the economy. Today, it stands out with a wide customer base ranging from individual consumers to commercial clients, as well as a broad range of financial products. In Türkiye, the banking sector has evolved and strengthened in line with political and economic developments. Through the experiences gained following financial crises, the sector has become one of the most prominent components of the Turkish economy.

Over time, financial exercises and auxiliary changes have affected the segment in different ways. The reason of this ponder is to explore the current variables influencing the productivity of Turkish banks, which have experienced a long verifiable change. Within the investigation, ROA, ROE, and NIM are utilized as benefit markers. Both macroeconomic factors and bank-specific pointers are included as free factors.

This proposal comprises of six primary segments. The primary chapter and the classification of banks in Türkiye. The moment chapter clarifies the advancement of the Turkish managing an account framework inside the setting of financial and political advancements. The third chapter gives a writing survey, summarizing prior studies related to the subject. The fourth chapter presents the dataset and traces the confinements of the consider. Within the fifth chapter, the strategy and observational comes about are presented. The models created in this chapter are assessed based on the budgetary structure of the banks. Finally, in the sixth chapter, the findings are summarized, and the conclusions drawn from the empirical analysis are clearly presented to the reader.

1.1. Definition of Commercial Banks

Banking has been a term defined in different ways from country to country. Although organizations that have changed over time are defined differently, there is no significant difference in the basic meaning.

Banks are commercial enterprises that demand funds by using their existing equity, deposits collected from the public and the facilities obtained from other sources, and offer the funds they collect through loans and other means. (Babuşçu,Hazar, 2019 p. 3)

As for the definition of a bank, a bank is an enterprise that collects deposits, extends credit to those in need through these deposits and its own equity, engages in intermediary transactions, engages in subsidiaries, and generally engages in all money-related activities. (Duran, 2005 p.4)

According to another definition, banks are institutions that, within a specific time period, accept the funds saved by natural and legal persons, utilize these funds in a profitable manner through lending and placement activities, and provide a wide range of services such as money transfers, bill collection, payment transactions, and the safekeeping of valuables. (Öçal & Çolak, 1988, p. 11; cited in Sucu, 2019, p. 3)

When these definitions are combined, it becomes possible to describe banks as licensed financial institutions that intermediate between fund suppliers and fund demanders, allocate resources not only from collected deposits but also from their own equity, and offer financial services such as money transfers, payment transactions, and the safekeeping of valuables.

1.2. Types of Bank in Türkiye

Pursuant to the Banking Law No. 5411 in Türkiye, the term 'bank' refers to deposit banks, participation banks, and development and investment banks. (Banking Law No. 5411, Art 3)

In Türkiye, banks can be classified according to their sources of capital or fields of activity. Based on their sources of capital and based on their fields of activity, banks include central banks, deposit banks, investment and development banks, and participation banks. (Hazine ve Maliye Bakanlığı, 2020 p.9)

1.2.1. Classification of Banks by Field of Activity

Although the Banking Law No. 5411 classifies banks by field of activity as development and investment banks, conventional banks, participation banks this classification should also include the CBRT. Central banks, due to their unique role in monetary policy implementation and ensuring financial stability, operate under a distinct field of activity and fulfill supervisory and regulatory functions that set them apart from commercial banking institutions.

1.2.1.1. Central Bank Republic of Türkiye

Central banks, often referred to as the "banks of banks," perform a number of essential functions within an economy, such as financing governments, contributing to the development of the financial system, implementing monetary policy, and issuing the national currency into circulation. The primary objective of a central bank is to ensure price stability by maintaining the value of the national currency. It also determines market interest rates by managing the supply of money and credit. Another key role is managing the payment system by holding the reserves of commercial banks. In doing so, central banks act as lenders of last resort and promote financial system stability through supervision and regulation of banks. (Hazine ve Maliye Bakanlığı, 2020 p.10)

The importance of central banks for a country's macroeconomic balance cannot be overlooked. While some central banks have a dual mandate of maintaining price stability and maximizing employment in the labor market, the objective of CBRT is to ensure price stability. However, in addition to this, it also fulfills four other core functions which are Financial Stability, Exchange Rate Regime, Issuing an Circulate Banknotes and Payment Systems.

Financial stability is defined as the uninterrupted and smooth functioning of the process through which savings are transformed into investments within the financial system, along with the system's resilience to potential shocks. (CBRT, 2025, p. 27)

Remote trade supply and request are essentially affected by macroeconomic basics, monetary-fiscal techniques, worldwide conditions, and desires within the markets. Indeed, in spite of the fact that the CBRT does not follow to a particular trade rate target, it may intercede when sudden trade rate developments or significant deviations from financial essentials jeopardize cost or monetary solidness. In such occasions, the Bank may take activity on certain components that influence the supply and request flow within the outside trade advertise to stabilize the rate. (CBRT, 2025, p. 28)

In Türkiye, the authority to issue banknotes belongs to the GNAT. The Assembly has granted the exclusive and perpetual privilege of printing and issuing banknotes to the Central Bank. Banknotes are designed and printed by the Banknote Printing Plant, which operates under the Central Bank and has been in service since 1958. (CBRT, 2025, p. 28)

The Central Bank is responsible for establishing new systems to ensure the secure and efficient transfer and settlement of funds and securities, ensuring the uninterrupted operation of existing and future systems, overseeing these systems, and implementing the necessary regulations. (CBRT, 2025, p. 27)

Price stability refers to a state in which inflation is so low that it is not a factor in economic decisions, and this situation is sustainable over time. Inflation is defined as a general increase in the prices of goods and services in an economy. In an inflationary environment, the amount of products and administrations that can be obtained with a given sum of cash diminishes over time, driving to a decrease within the esteem of cash and its purchasing power. In arrange to realize its essential objective of cost solidness, the Central Bank utilizes short-term intrigued rates decided by the Money related Arrangement Committee as a arrangement instrument. In an environment where cost soundness is kept up, all financial specialists can make more sound utilization, speculation, and sparing choices. Subsequently, sustainable growth and employment increase, economic stability is reinforced, and overall social welfare improves. (CBRT, 2025, p. 24)

1.2.1.2. Deposit Banks

According to Law No. 5411, deposit banks are defined as institutions operating primarily to accept deposits and extend loans on their own behalf and account, as well as the Turkish branches of such institutions established abroad. (Banking Law No. 5411, Art.3)

Although the law primarily addresses the authority to collect deposits and extend loans, deposit banks offer a wide array of financial services, including payment system operations, non-cash loans, money transfers, and transactions involving checks, promissory notes, and foreign exchange. Beyond these commercial activities, they too play a significant part within the execution of the Central Bank's financial approach.

CBRT may force limitations on the store and loaning intrigued rates of banks and non-bank monetary educate. Inside this system, separated intrigued rates can be connected over divisions; lower intrigued rates may be set for advances amplified to divisions focused on for advancement, with the point of channeling budgetary assets toward deliberately prioritized regions. (Akçay 1997, p.13)

1.2.1.3. Development and Investment Banks

They are characterized within the law as teach that work essentially to amplify credit, barring the acknowledgment of stores or support stores, and/or that fulfill obligations relegated to them by extraordinary laws, as well as the branches in Türkiye of such teach built up overseas.

Development banks are financial institutions established with the purpose of encouraging savings and providing funds, offering all forms of technical assistance to investment initiatives, financing industrial investments and enterprises, leading the establishment of investor and business ventures and participating in their capital, directing resources toward investments aligned with long-term development plans, annual program objectives, and the public interest, and reducing regional development disparities. As their core objective, development banks adopt policies aimed at distinctly separating savings from investments, due to the low levels of marginal savings and investment. In Türkiye,

the first development bank was the Türkiye Kalkınma Bankası, founded in 1975 primarily to channel the savings of workers abroad and the general public into productive use.

Investment banks are institutions that plays an intermediation role between firms in need of long-term funding through the issuance of securities and individuals or legal entities seeking to invest their savings in such securities. By doing so, they contribute to channeling savings into bonds and shares issued by firms. (Hazine ve Maliye Bakanlığı, 2020 p.11)

As of 2024, 20 this type of banks are operating in Türkiye.

Development and Investment Banks List (2024)

Table 1.1. Development and Investment Banks List (2024)

Publicly Owned Development and Investment Banks
İller Bankası A.S.
Türk Eximbank
Türkiye Kalkınma ve Yatırım Bankası A.S.
Privately-Owned Development and Investment Banks
Aktif Yatırım Bankası A.S.
BankPozitif Kredi ve Kalkınma Bankası A.S.
D Yatırım Bankası A.S.
Destek Yatırım Bankası A.S.
Diler Yatırım Bankası A.S.
Golden Global Yatırım Bankası A.S.
GSD Yatırım Bankası A.S.
Hedef Yatırım Bankası A.S.
İstanbul Takas ve Saklama Bankası A.S.
Misyon Yatırım Bankası A.S.
Nurol Yatırım Bankası A.S.
Q Yatırım Bankası A.S.

Tera Yatırım Bankası A.S.
Türkiye Sınai Kalkınma Bankası A.S.
Foreign Capital Owned Development and Investment Banks
Bank of America Yatırım Bank A.S.
Pasha Yatırım Bankası A.S.
Standard Chartered Yatırım Bankası Türk A.S.

(Source: *TBB, Note: Table 1.1. Continued.*)

1.2.1.4. Participation Banks

The concept of participation accounts is a distinguishing feature that sets participation banks apart from conventional banks. It represents one of the most fundamental differences, reflecting the interest-free banking model they are based on. Participation banks pool the funds they collect into a common fund. The returns generated from these funds are distributed to the fund providers based on a profit-sharing ratio, and the calculation process of this distribution is referred to as the unit value system. Each fund owner becomes a partner in the income generated from the extended credits in proportion to their contribution to the pool. It should also be noted that participation accounts do not offer a predetermined rate of return. Instead, returns are distributed based on the actual profit generated from the use of the pooled funds, in accordance with the principles of profit and loss sharing.

A Participation Account is the counterpart of a deposit account in conventional banking; however, the participation fund referred to in participation banking does not qualify as a deposit. The return on a Participation Account is not based on interest income but on the principle of profit-sharing derived from the projects financed by the bank. There is no predetermined or guaranteed return.(Türkiye Finans Katılım Bankası, 2025, Retrieved: 10.04.2025)

Islam unequivocally prohibits interest (riba) and all forms of economic activity involving interest or other illicit (haram) practices in commercial life. At the same time, it strongly encourages legitimate trade, corporate formation, the productive use of labor, capital, and

land, and the efficient mobilization of all human and economic resources into the economy. In this context, concepts such as Mudarabah (labor-capital partnership), Musharakah (profit and loss sharing partnership), and Murabaha (cost-plus-profit sale) are central to Islamic finance. (SPL, 2024, p. 76). Among these, the most commonly used financial product by participation banks in Türkiye is Murabaha, whereby a profit margin is added to the cost in the sale of goods.

As of 2024, 9 participation banks are operating in Türkiye.

Table 1.2. Participation Banks List (2024)

Digital Participation Banks
Technology Of Money Katılım Bankası A.S.
Hayat Finans Katılım Bankası A.S.
Participation Banks
Albaraka Türk Katılım Bankası A.S.
Dünya Katılım Bankası A.S.
Kuveyt Türk Katılım Bankası A.S.
Türkiye Finans Katılım Bankası A.S.
Türkiye Emlak Katılım Bankası A.S.
Vakıf Katılım Bankası A.S.
Ziraat Katılım Bankası A.S.

1.2.2. Classification of Banks by Ownership Type

In Türkiye, the classification of banks based on ownership structure takes into account the sources of capital. Accordingly, banks can be categorized as publicly owned, domestic private capital banks, or foreign owned, depending on whether their capital originates from the state, domestic private investors, or foreign entities. (Hazine ve Maliye Bakanlığı, 2020 p.9)

1.2.2.1. Publicly Owned Banks

A bank is considered a public capital bank if more than 50% of its capital is owned by governments or public institutions, and if its management and supervision are controlled by representatives of these institutions or individuals appointed by the government. (Hazine ve Maliye Bakanlığı, 2020 p.9)

In Türkiye, public banks have taken actions not only to support economic activity but also to improve prevailing economic conditions beyond profit-oriented objectives. Historically, the period until the mid-1930s and 1940s can be referred to as the era of public banking in Türkiye. This subject will be talked about in more detail within the moment chapter. This study focuses on deposit banks owned by the public sector. However, there are also other types of banks owned by the public that are not included in the scope of this research. As of 2024 there are four publicly owned deposit banks are operating in Türkiye. Among these banks, T.C. Ziraat Bankası has the largest asset size. It is also the bank with the largest asset size in Türkiye overall.

Table 1.3. Publicly Owned Deposit Banks List (2024)

Publicly Owned Deposit Banks
Türkiye Cumhuriyeti Ziraat Bankası A.S.
Türkiye Halk Bankası A.S.
Türkiye Vakıflar Bankası T.A.O.
Ziraat Dinamik Banka A.S. (Digital Bank)

(Source*: TBB)*

1.2.2.2. Domestic Private Capital Banks

Private banks are those whose capital does not include any public ownership and are owned by private individuals or institutions. They are generally established as commercial, deposit, or investment banks. (Hazine ve Maliye Bakanlığı, 2020 p.9)

The primary activity of banks in this category is to generate profit by extending loans to those in need of funds, using deposits collected from those with a surplus of funds. Other banking services often emerge in the course of carrying out this core activity. For example, a customer's request for a housing loan may lead to the opening of an account for that customer, the issuance of a credit card and an overdraft account, as well as the provision of insurance policies such as life insurance and compulsory earthquake insurance. These additional services not only complement the core banking function but also play a significant role in enhancing the bank's profitability. (Sucu, 2019 p.15)

As of 2024 there are 11 domestic private capital deposit banks are operating in Tukey.

Table 1.4. Privately Owned Deposit Banks List (2024)

Privately Owned Deposit Banks
Akbank T.A.S.
Anadolubank A.S.
Colendi Bank A.S. (Digital Bank)
Fibabanka A.S.
FUPS Bank A.S. (Digital Bank)
Şekerbank T.A.S.
Turkish Bank A.S.
Türk Ekonomi Bankası A.S.
Türk Ticaret Bankası A.S.
Yapı ve Kredi Bankası A.S.
Türkiye İs Bankası A.S.

(Source*: TBB)*

1.2.2.3. Foreign Owned Banks

Foreign-owned banks are institutions whose entire capital is owned by foreign individuals or entities. These banks may operate as a branch of a parent company headquartered in another country, or they may have been established directly in the host country through

foreign capital investment. (Hazine ve Maliye Bakanlığı, 2020 p.9). So, these banks can be considered as another countries' banks that operating in Türkiye. This is also a direct foreign investment and provides employment opportunities and support the economic activities in Türkiye.

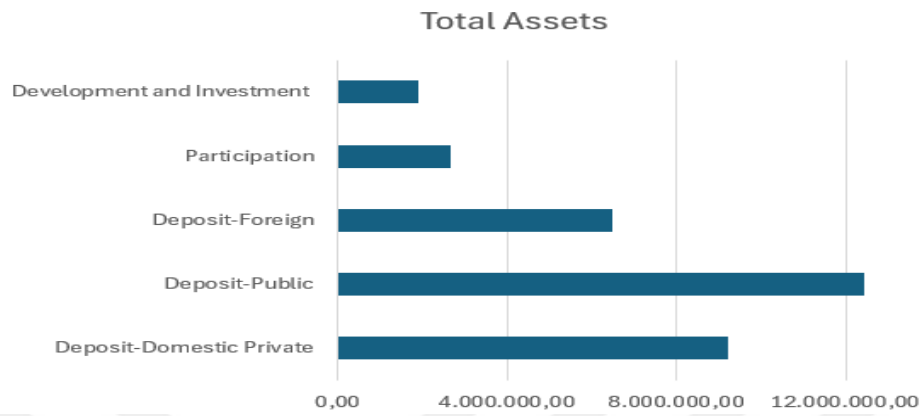
Table 1.5. Foreign Capital Owned Deposit Banks List (2024)

Foreing Owned Banks in Türkiye
Alternatifbank A.S.
Arap Türk Bankası A.S.
Bank of China Türkiye A.S.
Burgan Bank A.S.
Citibank A.S.
Denizbank A.S.
Deutsche Bank A.S.
Enpara Bank A.S.
HSBC Bank A.S.
ICBC Türkiye Bank A.S.
ING Bank A.S.
MUFG Bank Türkiye A.S.
Odea Bank A.S.
QNB Bank A.S.
Rabobank A.S.
Turkland Bank A.S.
Türkiye Garanti Bankası A.S.

(Source*: TBB*)

Their shares in the market are shared by asset size in Figure 1. As of 2024 December, the share of the Development and Investment Banks is 5,76%, Participation Banks has 8,14%, Deposit Foreign owned banks has 19,85%, Domestic Public Banks has 38,07% and Deposit Domestic Private Banks has 28,17% share in the market.

Figure 1.1. Asset size by Types of Banks in Türkiye



(Source: *BRSA Advanced Analysis)*

HISTORY OF TÜRKİYE BANKING INDUSTRY

The banking sector in Türkiye can be separated into two timelines. One is the Ottoman period, during which banking activities were very limited. The other is the Republican period, starting from 1923 and continuing to the present day.

2.1. Banking in Ottoman Era

Banking remained limited during the Ottoman Empire, primarily due to its failure to adapt to Europe's Industrial Revolution, the dominance of small-scale enterprises, and its relatively closed economy. Although there was no formal banking system, individuals called Sarrafs or Galata bankers carried out similar financial activities. (Parasız, 2018 p.107)

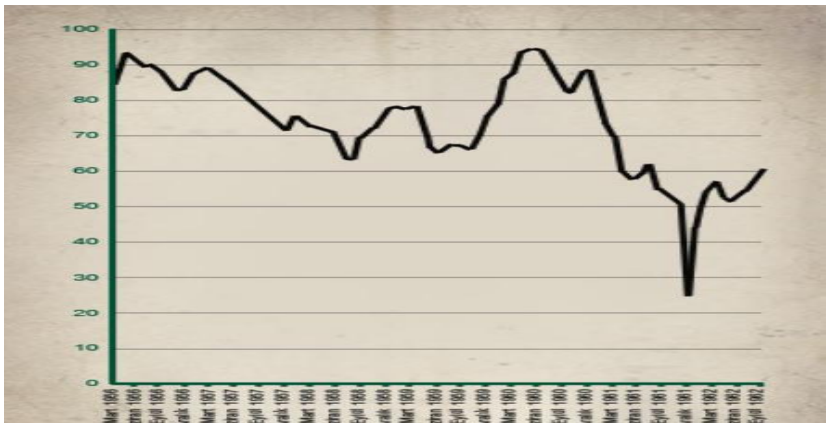
There is some debate about the foundation date of, but most researchers agree that it was the Dersaadet Bank, also known as the Banque de Constantinople. Sources cite conflicting years—1843, 1845, 1846, 1847, or 1849, but it is widely accepted that the bank was established with government support by two Galata bankers, J. Alleon and Theodor Baltazzi, to stabilize exchange rates. However, due to growing foreign trade imbalances, the bank failed and closed in 1852. (Al, 2011; cited Ortabağ, 2018, p. 21)

One imperative illustration is the Ottoman Bank, which was established in 1856 through the endeavors of two British business visionaries, Stephen Sleigh and Dwindle Pasquali, and with the endorsement of Ruler Victoria. (Ottoman Bank Museum, 2025). During this period, the Empire was in need of a national bank to help solve financial problems and support economic activities. The Ottoman Bank was expected to serve both as a state and a commercial bank, and also to continue the work of maintaining exchange rate stability started by Dersaadet Bank. Despite its public functions, its capital was foreign owned, reflecting the era's constraints. The government granted the Ottoman Bank a 10-year monopoly, during which no other bank would be allowed to be established. (Ortabağ, citing Al, Akar & Bayraktar, 2011, pp. 67–76, p. 23)

By 1862, one of the biggest problems for financial stability was the use of unbacked paper money, called kaime, which was issued to cover state deficits. Although these kaimes were promised to be equal to gold, they quickly lost value, caused gold and silver to disappear from the market, and led to financial losses for the public. In 1862, the government started withdrawing these kaimes by offering 40% cash and 60% government bonds in return. This helped restore financial stability. The Ottoman Bank, along with Marquis de Plœuc, played an important role by arranging a loan of £8,000,000 from London on behalf of the government. (Ottoman Bank Museum, 2025)

After the removal of the kaimes, financial reforms were initiated, and efforts began to establish a national bank. As a result, in 1863, the *Bank-ı Osman-ı Şahane* (Imperial Ottoman Bank) was founded. However, this led to a legal dispute, as the 10-year privilege given to the Ottoman Bank had not yet ended. The issue was taken to a British court. During this process, shareholders of the Ottoman Bank were offered the chance to join the new bank. Eventually, the Ottoman Bank entered the liquidation phase. Ortabağ (2018, pp. 39-42)

Figure 2.1. The Depreciation of Kaime



(Source: *Ottoman Bank Museum Retrieved 9 April 2025.* https://obmuze.com/#the-withdrawal-of-kaimes/the-founding-years)

During the Ottoman period, banks establishment rate was very low. Due to hard conditions of the economics, as well as the demographic structure, banks in the Ottoman era mostly operated with the support of foreign capital. Mithat Pasha took important

actions in laying the foundations of national banking. In 1863, he established the first agricultural credit fund called “Memleket Sandıkları”. Later, in 1868, he founded the “Emniyet Sandığı” to gather the small and scattered savings of the public and channel them to those in need of funds. This institution was later linked to Ziraat Bank in 1907, which is still operating today. Between 1911 and 1923, further efforts were made to support the development of national banking. (Parasız, 2018 p.107). In 1923, the Ottoman Empire came to an end and the Republican era began.

2.2. Banking in the Republican Era

In the Republican period, banking was shaped over time by both global and local trends. Turkish banking in the Republican period can be examined in five main phases. The first phase covers the years 1923 to 1944. During this time, the newly established Republic of Türkiye needed financial resources to support its economic activities after the war, and the demand for banks increased.

The second phase includes the years 1944 to 1980 and can be divided into two parts:

- From 1944 to 1967, large private banks were established.
- From 1967 to 1980, state intervention in the banking sector increased significantly.

The third phase, from 1980 to 1990, was a period of structural transformation for banks. The fourth and fifth phases involve the banking crises and restructuring efforts in the 2000s. (Parasız, 2018 p.109)

2.2.1. The First Banks of the Republic (1923-1944)

To understand banking between 1923 and 1944, it is important to consider Türkiye’s economic conditions at that time. Two major factors affected the Turkish economy between 1923 and 1929: the terms of the Lausanne Treaty and the Great Depression of 1929. (Boratav, 2003 p.33)

Although Türkiye was a newly founded state, it was made responsible for two-thirds of the Ottoman Empire's debts under the Lausanne Treaty. This debt was around 85 million gold lira, with an estimated annual payment of about 6 million lira. However, a later agreement postponed these payments until 1929. The first payment in 1929 was approximately 15 million lira, which played a major role in creating a foreign exchange crisis for the young Republic. Additionally, a trade agreement signed alongside the Lausanne Treaty removed restrictions on foreign trade for five years and froze customs tariffs. (Boratav, 2003 p.33)

As a result, Türkiye emerged from war but was limited in applying protectionist economic policies during its early years. These constraints created serious economic challenges. During this period, The banking sector has consistently held a pivotal position within the functioning of the economy. Between 1923 and 1938, several major developments occurred:

- The founding of İş Bank,
- The founding of Sanayi ve Maadin Bank,
- The transformation of Ziraat Bank into a joint-stock company,
- The creation of Emlak ve Eytam Bank,
- And the founding of the Central Bank.

In addition to these, many small local banks were also established. Some of these are listed in Table 6.

Table 2.1. Local Banks (1923-1932)

Local Banks (1923-1932)
Tütüncüler Bankası
Afyon Terakki Servet Bankası
Eskişehir Bankası
Denizli İktisat Bankası
Kocaeli Bankası

Egebank
Elazığ İktisat Bankası
Efesbank
Sağlık Bankası
Karaman Çiftçi Bankası

(Source*: Parasız, 2018 p.108*)

Although many banks were active during this period, İş Bank holds a special place among them. The bank was founded in 1924 through the cooperation of political leaders and financial elites and remains active to this day. Celal Bayar, who had surrendered from his position as Serve of Recreation, and ended up common supervisor of the bank, whereas the chairmanship of the board was given to Mahmut Bey, a part of parliament from Siirt. İş Bank played a exceedingly compelling part in bridging household and outside capital with political specialist amid this period. It too acted as a effective drive in forming financial arrangements in line with the requests of the trade and monetary community. (Boratav, 2003 p.41)

Before the five-year period stipulated by the trade agreement expired, preparations were made regarding changes in customs duties. Due to stockpiling and speculative activity, the British pound, which was around 10 lira during the first seven months of 1929, rose to 10.5 lira. This coincided with both the global Great Depression and the period when Türkiye had to make its first debt payment of approximately 15 million lira inherited from the Ottoman Empire. Between 1929 and 1931, regulations and controls on foreign exchange transactions gained importance. During his investigations in Türkiye in 1929, the Italian expert Count Volpi emphasized the necessity of establishing a central bank to ensure the stability of the Turkish currency. In line with such recommendations, the government initiated work on drafting the necessary legal framework for a central bank. With contributions from Professor Leon Morf of the University of Lausanne, a draft law was prepared. This draft was approved by the GNAT. (Boratav, 2003 p.49)

The Great Depression and trade-related problems in 1929 had a negative impact on both agriculture and manufacturing. These challenges laid the foundations for the state-led economic model. With the implementation of the First Five-Year Development Plan in

1934, a new era began in which major state-owned banks were established. The key state banks founded after 1930 were outlined to bolster diverse divisions of the economy.of the economy. These are listed in Table 7.

Table 2.2. State Banks (1930-1940)

Name of Bank	Date of Establishment
Sanayi Kredi Bankası	1932
Sümerbank	1933
İller Bankası (Belediyeler Bank)	1933
Etibank	1935
Deniz Bank	1938
Türkiye Halk Bankası ve Halk Sandıkları	1938

(Source: *Parasız, 2018 p.108*)

Founded in 1925, the Sanayi ve Maadin Bankası was transformed into the Sanayi ve Kredi Bankası in 1932. Sümerbank, established in 1933, aimed to support industrial development, while Türkiye Halk Bankası and its affiliated Halk Sandıkları, founded in 1938, were created to provide credit to small tradespeople and artisans. The İller Bankası, established in 1933, was designed to finance local governments and offer credit for the development of infrastructure systems. Deniz Bank, on the other hand, was founded to operate regular postal services between Turkish and foreign ports, manage urban maritime transport, and carry out various port-related activities. The 1930s also marked the end of the era of local banks. (Parasız, 2018 p.108)

2.2.2. The Period of Private Banks and Public Interventions (1944-1980)

The period between 1944 and 1980 was marked by significant political and economic developments that played a key role in shaping the banking sector. This era witnessed the emergence of large private banks, while state interventions became increasingly visible

in the middle of the period. Therefore, in line with the literature, this period is divided into two sub-periods. (Parasız, 2018 p.108)

2.2.2.1. Private Bank Era (1944-1967)

Türkiye did not participate Second World War but it has affected. Concerns over national security led to the mobilization of a large portion of the adult male population. This resulted in a severe decline in production, with agricultural output falling by nearly 50%. (Boratav, 2003 p.81)

High levels of security concerns and the conscription of working-age men were significant factors contributing to the contraction in economic activity. Military expenditures gained prominence during this period, and government demand for credit from banks increased. In 1942, the required reserve ratio was raised to 20%, and banks were mandated to invest these reserves in domestic government bonds. (Zarakolu, 1973; cited in Yılmaz, 2007, p. 75) As the state's demand for funds increased, fewer resources were available for production, further constraining economic activities due to labor and capital shortages.

The year 1946, which followed the end of the war, was politically and economically critical. Politically, it marked the transition from a single-party regime to a multi-party system. Economically, it was the beginning of a gradual relaxation of the inward-oriented, protectionist economic policies that had been in place since the 1930s. (Boratav, 2003 pp.93-94) From 1946 to 1953, rapid economic growth occurred, although this was largely a recovery from the war years. Notably, real GDP only returned to its 1939 level by 1948. (Boratav, 2003 p.101) During this period, increased transaction volumes and payment activities revitalized the banking sector, and private banks began to grow. establishment of Akbank, Tütünbank, and T. Kredi Bankası in 1948. (Parasız, 2011 p.25)

The rise to control of the Democrat Party in 1950 was critical for the industry. The party's financial program pointed to decrease the part of the state within the economy and bolster private undertaking. (Kazgan, 2006 p.84) The expansion of private initiatives, the influx of foreign loans, and increased export revenues—especially from cotton due to the

Korean War—were key factors driving rapid economic growth between 1950 and 1954. The Foreign Investment Encouragement Law enacted in 1954 further supported this expansion. While inflation rose, interest rates remained fixed, empowering investment funds and contributing to the advancement of the managing an account division.

In this period of time, 25 new banks were founded, most of them privately owned. In addition to these, Türkiye Vakıflar Bankası, Türkiye Öğretmenler Bankası, and the previously closed Denizcilik Bankası resumed operations. In 1950, the first non-bank financial institution, the TSKB, was established. The branch network of banks expanded significantly, reaching 60 banks and 1,699 branches—including the Central Bank—by 1960. The Banking Law No. 7129, enacted in 1958, was aligned with the economic policies of the time and granted state banks full autonomy in lending activities. Major state expanded into rural areas, while many smaller banks were liquidated. (Parasız, 2018 pp.108-109)

Türkiye financed expanded imports through official outside help, merchant credits, commercial advances, and remote capital inflows. Totally, Türkiye utilized approximately $1 billion in program loans, $600 million in importer credits, and $210 million in commercial loans. However, project loans amounted to only around $72 million. In the absence of income from factor services and transfers, Türkiye's trade balance remained in deficit from 1947 onward. The level of imports was essentially determined by the volume of external credit available. After 1953, even these loans failed to support further import growth. (Kazgan, 2006 p.88)

New powers granted to commercial banks regarding capital imports were among the key factors leading to Türkiye's eventual inability to service its debts. The Central Bank lacked independence in its policies, and while inflation created pressure for more imports, the government avoided devaluation. This led to a growing trade deficit until 1955. Between 1956 and 1958, external borrowing was restricted, which helped reduce the trade deficit. Although the Central Bank was responsible for repaying foreign debts in foreign currency, it lacked oversight over how these funds were used, leading to the import of unrelated goods not aligned with growth targets. Meanwhile, the Central Bank's short-

term foreign currency debt increased steadily. In the end, the use of credit-based imports rendered Türkiye unable to repay its commercial foreign debts. (Kazgan, 2006 pp.88-89)

2.2.2.2. Banking Era (1961-1980)

The haphazard state interventions carried out in the name of a free market economy during the 1950s laid the groundwork for the transition to planned economic development in the 1960s. (Kazgan, 2006 pp.88)

During this period, when economic activities were tied to five-year development plans and annual programs, the adoption of an import substitution industrialization strategy similarly influenced the approach to financing. (Parasız, 2018 p.108) Within the arranged period, the keeping money segment came beneath noteworthy open weight. Intrigued rates connected to stores and credits, and advance impediment were decided in line with the moment substitution arrangement; the essential part of banks was characterized as giving financing for the speculations sketched out within the advancement plans. Amid this time, no modern commercial banks were permitted to be set up, but for modern remote banks and a few uncommon cases. (Türkiye Bankalar Birliği, 2008 p.12)

During the 1962 and 1977, seven new banks were founded. (Türkiye Bankalar Birliği, 2008 p.12) According to some sources, the 2 of them are classified as non-bank financial institutions because they did not collect deposits. (Parasız, 2018 p.109)

Table 2.3. Founded Banks During 1962-1967

Name of Bank	Date of Founding
T.C. Turizm Bankası	1962
Sınaı Yatırım ve Kredı Bankası	1963
Devlet Yatırım Bankası	1964
Turkiye Maden Bankası	1968
Devlet Sanayi ve İşçi Yatırım Bankası	1967

Amerikan-Türk Dış Ticaret Bankası	1964
Arap-Türk Bankası	1977

(Source: *Parasız, 2018 p.109*)

Devlet Sanayi ve Isci Yatirim Bankasi was founded primarily in order to create an opportunity for savings of Turkish workers who employed in abroad. Through providing credit, developing partnerships, and offering technical consultancy, it played an active role in supporting publicly held and widely owned joint-stock companies. This bank aimed to contribute to the initiatives of Turkish workers abroad in Türkiye, and in 1988, it was renamed "Development Bank of Türkiye. (Artun, 1983; cited in Türkiye Bankalar Birliği, 2008, p. 12)

By the mid-1970s, a period began in which holding companies started to own banks. The removal of the upper limit on credit amounts that banks could extend to affiliates in which they held at least 25% of the capital, as per Article 38 of Law No. 7129, was a major factor behind this development. During this period, it was observed that holding companies acquired small local banks. (Parasız, 2018 p.109)

2.2.3. The 1980-1990 Banking Era

By the late 1970s, economic stagnation triggered by persistent balance of payments problems made it necessary to adopt a new industrialization strategy that could also meet the foreign exchange needs of the industrial sector. In 1980, the import-substitution industrialization model, which focused on domestic market production, was abandoned. Instead, a development policy grounded in a market economy was introduced—prioritizing openness to international markets and export-oriented production. (Türkiye Bankalar Birliği, 2008 p.14)

Starting from July 1, 1980, with the liberalization of interest rates, deposit and loan interest rates began to rise rapidly. During this period, banker institutions became widespread and offered high returns to savers who deposited money with them. This development forced banks to adapt to the emerging trend. Following the rapid increase in

interest rates, so-called “gentlemen’s agreements” were observed among banks. (Parasız, 2018 p.109) The liberalization of the interest rates started a competition between banks and bankers ended up with a financial crisis. (Boratav, 2003 p.151)

In 1982, the Capital Markets Law was enacted. With the establishment of the Istanbul Stock Exchange in 1986, the trading of bonds, bills, repos, and stocks grew rapidly, and the prominence of these alternative returns made it increasingly difficult for banks to obtain low-cost funds. Another important development during this period was the establishment of the Interbank Market within the Central Bank of Türkiye. Due to banks’ liquidity needs, significant transaction volumes occurred. Interest in capital markets increased, and banks established investment funds within their organizations. Wholesale banking with few branches became widespread, with contributions from foreign-capital banks in this area. (Parasız, 2018 p.110)

Technological advancements in the 1980s significantly impacted banks. Banks did not remain indifferent to developments in computer and electronics technologies; taking foreign banks as examples, they made efforts to establish automation systems and most completed their technological infrastructure work by the 1990s. Alongside these developments, new products in retail banking, such as ATMs, consumer loans, and credit cards, were introduced. In 1986, the Interbank Money Market was established to enable banks to use their resources more efficiently. Banks with unused cash lent money to other banks, generating income and fulfilling short-term liquidity needs through alternative markets. This eliminated the Central Bank’s need to resort to additional money issuance. (Parasız, 2018 pp.110-111)

As in previous periods, high levels of financing deficits in the public sector during this era, especially after 1989, dragged the economy into a “high interest–high inflation” spiral. Financing portion of the developing budget shortfalls with Central Bank assets expanded inflationary weights, whereas covering the rest through household borrowing altogether raised the open sector's request for money related assets. In spite of the liberalization of capital developments, inflationary arrangements based on household request made considerable weight on the adjust of installments, coming about in higher genuine intrigued rates. The failure to implement effective policies to correct

macroeconomic imbalances increased economic uncertainty and worsened expectations. This situation negatively affected the financial sector's functioning and supervisory processes, reflecting the deterioration in overall economic discipline. (Türkiye Bankalar Birliği, 2008 p.15)

2.2.4. The 1990-2001 Banking Era

Amid the 1990s, the share of remote cash store accounts in add up to stores rose altogether. This increment was essentially driven by the wonder of money substitution, whereby nearby money was supplanted by remote monetary forms as a result of tireless tall swelling. In 1989, remote trade exchanges and capital developments were liberalized, and in 1990, the Turkish Lira was pronounced convertible. Beginning that year, non-resident people were allowed the correct to contribute in securities in Türkiye and to open store accounts in both Turkish Lira and outside monetary standards. Moreover in 1990, the Central Bank presented and started executing a financial program pointed at improving consistency in monetary markets. In 1992, the EFT framework got to be operational, marking a noteworthy step within the digitalization of the country's money related framework. (Keskin,Berrin, 1993; cited in Türkiye Bankalar Birliği, 2008, pp. 14–16)

Following the adoption of convertibility, Türkiye began to encounter economic challenges that bore resemblance to those faced by the Ottoman Empire in the post Tanzimat period primarily linked to the growing influence of finance capital. The country experienced a series of economic crises in 1991, 1994, and again between 1998 and 1999. During the 1990s, capital mobility became nearly unrestricted, much like the liberalization of trade flows, with only a few minor jurisdictions remaining as exceptions. Initiated by the convertibility of the Turkish Lira in the latter half of 1989, this liberalization momentum eventually culminated in the complete deregulation of Türkiye's financial markets. (Kazgan, 2006 p.154)

The side effects of the liberalization policies implemented in the 1980s led to significant changes in our banking system. During this period, the fragility of banks increased, and

short-term difficulties were frequently encountered.[65] During the 1994 financial crisis, the issue of bank and intermediary institution failures resurfaced. Among the most notable cases, Turkish Invest AOG and ten other intermediary firms were barred from operating. Bank Ekspress changed ownership, while TYT Bank, Impexbank, and Marmara Bank collapsed, causing significant losses. These included the deposits of thousands of customers, many of whom had been attracted by the promise of high interest rates, as well as large sums of public funds, especially in the case of TYT Bank. (Kazgan, 2006 p.230)

In April 1994, measures were observed to be taken to reduce problems and risks. Some of these measures included reducing exchange rate risk arising from banks' open positions and subjecting foreign currency liabilities to legal reserves, regulations on repo and reverse repo transactions, audits of banks' establishment and equity capital, and raising criteria for short-term advances. However, the most important was the implementation of a 100% guarantee to increase savers' confidence in the banking system. Although these decisions solved short-term problems, crises continued due to neglecting the fundamental issues. Furthermore, macroeconomic stability was lost due to the international crises affecting Türkiye in 1999, which resulted in new crises within the banking system. (Parasız, 2018 p.111)

Moreover, the date 23.06.1999 is important in terms of Türkiye banking history. It was established as an authority with public legal personality, administrative and financial autonomy with the Banking Law No. 4389 published in the Official Gazette No. 237234. (BRSA,2025 Retrieved April 12, 2025)

2.2.5. Banking Industry in Türkiye After 2000

On January 1, 2000, Türkiye received a slithering peg trade rate administration. With the launch of the program, expectations emerged in the banking sector that interest rates would decline further. As a result, banks avoided long-term commitments to high-interest liabilities. Moreover, the pre-announcement of the exchange rate basket made foreign currency-denominated resources more attractive than Turkish Lira ones. Consequently, some banks tended to utilize short-term liabilities in foreign currency while issuing long-

term loans in Turkish Lira. In 2000, a noteworthy increment was watched within the share of advances inside add up to resources, whereas possessions of profoundly fluid securities declined. Customer advances rose about fourfold compared to the conclusion of the past year. This shift in the structure of bank balance sheets heightened their exposure to liquidity, interest rate, and exchange rate risks. Unresolved structural problems within banks and the lack of adequate precautions were key factors that contributed to the emergence of the crisis. Additionally, although the BRSA was established in June 1999, it did not become operational until August 31, 2000, which was one of the main causes of the crisis. The crisis that erupted in November 2000 was essentially a liquidity crisis. It was triggered by the inability of public and fund banks to liquefy their assets and the withdrawal of deposits by surplus-liquidity banks. The realization of risks carried on the balance sheets of certain banks further deepened the crisis, eventually disrupting the stabilization program. (Parasız, 2018 pp. 112-113)

Following this, financial assistance from International Monetary Fund and a series of measures provided partial relief in financial markets, leading to a temporary decline in market interest rates. However, a second crisis broke out in February 2001, resembling the one from November 2000, exacerbated by a large debt redemption and political tensions. On February 22, 2001, the Turkish Lira was floated, initiating a period in which a banking crisis and a currency crisis occurred simultaneously. Unlike the 2000 crisis, the 2001 crisis became systemic. The Central Bank attempted to control liquidity in response to a surge in demand for foreign currency, but the resulting liquidity shortage, especially the excessive daily liquidity needs of public banks, caused the payment system to freeze. (Parasız, 2018 p.113)

The February 19, 2001 crisis had a severe impact on the real sector. The number of banks transferred to the SDIF rose to 18. Among these were banks such as EGS Bank, Tarişbank, Kentbank, Bayındırbank, and Sitebank, which were involved in funding export-oriented sectors like agriculture and textiles, as well as SMEs. According to reports by TESK, 52,800 businesses shut down in the first half of the year. The Ankara Chamber of Commerce reported 15,317 closures in the first five months alone, and 94,905 closures between 1998 and May 2001. Initial estimates suggested 11,000 job losses due

to the banking turmoil, later revised to 80,000. Surviving banks began seeking foreign partners. The government launched a series of rescue measures, but these increasingly burdened the state's foreign currency obligations. The turmoil in the banking sector not only affected public finances but also accelerated the process of dollarization in the economy. (Kazgan 2006, p.454)

On May 15, 2001, the Banking Sector Restructuring Program was announced. It aimed to establish a more resilient, competitive, and internationally integrated banking sector focused on financial intermediation. The program prioritized repairing the damage caused by the crisis and building a sound foundation by eliminating weak banks from the system.

The Restructuring Program was built upon four main pillars to address the vulnerabilities outlined earlier:

- The budgetary and operational rebuilding of public banks,
- The swift resolution of banks under the control of the SDIF,
- The rehabilitation of private banks adversely affected by the crisis,
- The implementation of legal and institutional reforms to enhance supervision, improve sector efficiency, and promote competitiveness. (BRSA, 2009 p.11)

In 2005, with the sanctioning of Managing an account Law No. 5411, the specialist of the BRSA was extended. Nowadays, the BRSA plays a key part within the Turkish keeping money framework. Drawing lessons from past crises, significant steps have been taken in identifying and addressing structural weaknesses in banks. Through daily, weekly, monthly, and annual reports, a strict supervisory approach has been adopted. This has improved transparency and helped detect structural issues in advance.

As shown in this section, the Turkish banking sector has undergone profound transformation over time, driven by political and economic developments. Technological advancements and digitalization have a key part in moving forward the effectiveness of managing an account frameworks . Banks have swiftly adapted to these changes and, supported by a competitive environment, have emerged stronger. With robust capital structures and the adoption of professional management practices, the Turkish banking system today is more resilient to systemic shocks. As of December 2024, the sector

employed a total of 209,001 personnel domestically and abroad, highlighting its significant impact on overall economic activity.

LITERATURE REVIEW

Demirgüç-Kunt and Huizinga (1999) analyzed panel data from 80 countries covering 1988–1995 to identify the determinants of bank profitability. They found that, in developing countries, inflation is positively related to bank profitability and that banks with foreign ownership tend to be more profitable. This study is widely cited in the literature on bank performance. (Demirgüç-Kunt & Huizinga, 1999)

Kaya (2002) examined 44 Turkish banks (including deposit and public banks) during 1997–2000 using the two-step approach developed by Ho and Saunders (1981). In the first stage, author used ROA, ROE, and NIM to calculate a "pure spread" based on the estimated time dummies and fixed effects. In the second stage, this pure spread was used as the dependent variable to analyze macroeconomic determinants. Kaya found that both NIM and ROA were significantly affected by inflation and the consolidated budget deficit, whereas ROE was significantly influenced by inflation, the budget deficit, and the real interest rate (Kaya, 2002).

Tunay and Silpar (2006a, 2006b) conducted two related studies in which Turkish banks were classified by size and ownership to analyze profitability determinants using panel data. They examined the effects of internal and external variables on profitability indicators (ROA, ROE, and NIM). The first study found that factors such as inflation, real GDP, the ratio of loans to total assets, the ratio of non-interest income to total assets, and the ratio of total assets to GDP were significant determinants of profitability. The follow-up study reported results that support the findings of the initial analysis (Tunay & Silpar, 2006a, 2006b).

Atasoy (2007) used a balanced panel data analysis of 26 Turkish banks from 1990–2005 to study profitability. He set ROA and NIM as dependent variables and categorized independent variables into bank-specific factors and macroeconomic indicators (inflation and real GDP growth). The study found a positive relationship between inflation and NIM and identified a statistically significant positive effect of inflation on ROA when both bank-specific and macroeconomic factors were included (Atasoy, 2007).

Ben Naceur and Goaied (2008) studied 10 major Tunisian deposit banks over 1980–2000 using a balanced panel approach. The dependent variables were NIM and ROA, and the regressors included bank-specific and macroeconomic factors. They found that macroeconomic variables did not have a statistically significant impact on bank profitability in Tunisia (Ben Naceur & Goaied, 2008).

Yıldırım (2008) examined factors determining the profitability of Turkish deposit banks and development-investment banks during 2002–2007. Using monthly data and a multiple regression model with ROA and ROE as dependent variables, the study found that consumer price inflation affects negatively bank profitability, while the industrial production index and the industrial production-to-budget balance ratio had positive effects (Yıldırım, 2008).

Gündoğdu and Aksu (2011) investigated the long-term relationships between macroeconomic factors and the profitability of Turkish deposit banks using a cointegration-bounds approach. They employed quarterly data from 1994–2008, with ROA, ROE, and return on equity as dependent variables, and inflation, the consolidated budget deficit, the industrial production index, and real interest rates as independent variables. The authors found that positive real interest rates had a long-term positive effect on ROA but a negative effect on ROE, with a positive short-term effect on ROE. They also found that inflation negatively affects ROA in both the short and long run and that its effect on ROE was positive in the short term but negative in the long term (Gündoğdu & Aksu, 2011).

Kansoy (2012) focused on the determinants of net interest margin (NIM) in Türkiye and examined whether ownership structure influenced the results. Using quarterly panel data from 2001 to 2012 (excluding the crisis-affected period of late 2001), the study found no significant correlation between real GDP growth and NIM. However, a positive relationship was observed between inflation and NIM. The analysis also differentiated among bank ownership types (public deposit, foreign deposit, and private deposit banks) and showed that liquidity risk positively influenced NIM in foreign banks. Credit risk has negative effect on NIM in foreign and private banks, whereas it had a positive effect in public banks (Kansoy, 2012).

Güneş (2015) focused on determinants of ROA and ROE in Türkiye and examined Turkish banks creating bank groups by basing on ownership types of deposit banks. In the research annual datas are used covering the years between 2002-2012. As a result lower NPL rates and inflation expectations have positive impact on profitability of banks.

Sucu (2019) compared factors affecting the performance of participation banks and conventional deposit banks in Türkiye from 2005 to 2017 using annual data. The study included 11 deposit banks and 3 participation banks, and it used ROA and return on equity ROE as dependent variables, with various bank-specific and macroeconomic variables as independent variables. The analysis was conducted using panel data methods across six model specifications. The results indicated that inflation had no significant effect on ROA for either type of bank. For ROE, a significant negative relationship with inflation was found for deposit banks, while no significant effect was observed for participation banks. Similarly, GDP growth was not significantly related to ROA in either group. The ratio of NPL had a significantly negative impact on both ROA and ROE for both bank types (Sucu, 2019).

DATA

In the study, it was tried to determine the determinants of profitability of banking sector. data were collected from 4 bank types to conduct analysis. Deposit banks are grouped according to their ownership types and the participation banks regardless of their ownership type. In the study, deposit banks are grouped as domestic private, public and foreign capital. The research covers the years 2010-2024. Quarterly data for this period are used. Bank-specific variables and dependent variables are obtained from the data set provided by the BRSA.

As a limitation in the Metadata section for the ratios used by the BRSA, data of Birleşik Fon Bankası A.S. and Adabank A.S. as of March 2014 and data of Türk Ticaret Bankası A.S. as of April 2022 are not included in dataset.

An explanation of the data mentioned in Table 9 is given. However, in order to be more descriptive, It was felt necessary to specify how the relevant data is presented in the metadata, as referred to in the ratios section.

Total Cash Loans = Loans+ Non-Performing Loans (Gross)+Financial Lease Receivables

Average Total Equity, Assets, Interest Bearing Liabilities is calculated as the average of the relevant year within the calendar year.

4.1. Potential Limitations of the Study

4.1.1. Other Provisions

In recent periods, it has been observed that banks have received qualified audit opinions from auditing firms due to the allocation of discretionary provisions in a manner that is inconsistent with reporting standards. Since this practice suppresses net profit, it may lead to misleading or inaccurate results in the analysis.

4.1.2. FX Protected Deposit Program

The policy implemented on December 20, 2021, in response to exchange rate volatility in Türkiye, may have caused fluctuations in banks' funding costs and foreign exchange profits.

4.1.3. Security Maintenance Requirement

The regulation announced on June 10, 2022, may have caused a delayed impact on banks' profitability levels, either due to the introduction of credit restricting measures or as a result of sanctions imposed on banks that exceeded the specified requirements.

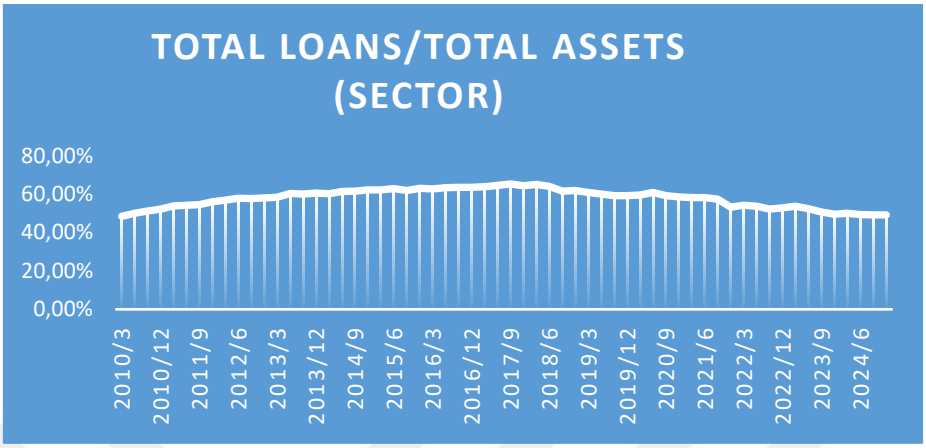
4.2. Definition of Variables

4.2.1. Dependent Variables

As observed in the Literature Review part generally 3 major indicators are used as a measure of profitability. Return on Assets (ROA), Return on Equity (ROE) and Net Interest Margin (NIM).

Return on Asset is a ratio that shows how effectively firms use their existing assets. It is calculated by dividing Profit (Loss) for the Period by Average Assets. The relevant data were obtained from the advanced notation section of the BRSA website. In general, 10 main items are used in reporting the assets of banks in Türkiye. An analysis of quarterly data for the period between 2010 and 2024 reveals that loans constituted the largest share among asset classes. The highest ratio was observed in the third quarter of 2017 at 65.29%.

Figure 4.1. Quarterly Total Loans / Total Assets Ratio of Sector (2010/3-2024/12)



(Source*: BRSA Dataset Sector*)

Return on Equity is an important measure used to calculate the return on capital invested in firms. For this reason, investors and company management use the return on equity ratio to understand company profitability and how effectively capital is used.

Net Interest Margin is the proportion gotten from the proportion of intrigued pay net of intrigued costs to resources. Net intrigued wage can be appeared as the most working benefit of banks. By barring non-interest salary and non-interest costs from the calculations, it appears what level of intrigued pay or cost the bank wins compared to its current resources.

4.2.2. Independent Variables

Although not frequently encountered in the literature, the variables NINEX and IEXLC, for which similar counterparts exist, were included in the study with the expectation that they would contribute to the discussion by offering different perspectives.

4.2.2.1. Non Interest Income to Non Interest Liability Ratio (NINEX)

These are items that represent the total of revenues earned by banks other than interest income from loans and securities, including fees and commissions, capital market

transactions, and foreign exchange gains. In cases where banks experience a decline in net interest income, it is likely that they shift towards alternative sources of income.

It has been observed that during periods when the net interest margin increases, the ratio of non-interest income to total assets tends to decrease, whereas during periods of narrowing net interest margin, this ratio tends to rise. (Atasoy, pp. 18–19)

4.2.2.2. Non Performing Loans (NPL)

This ratio refers to loans that encounter repayment problems and are therefore classified as non-performing. It provides insight into the asset quality of banks.

4.2.2.3. Interest Expense / Average Interest Bearing Liabilities (IEXLC)

It is well known that the funds collected and loans extended by banks include a cost for the banks themselves. The impact of interest-bearing liabilities on interest expenses is significant from the perspective of asset-liability management. An increase in this ratio may be expected to put pressure on the interest margin, depending on the structure of the balance sheet.

4.2.2.4. Inflation (MINF)

It may be a nonstop increment within the common level of prices. The word “continuous” is imperative here. A ceaseless increase within the costs of a few merchandise or a one-off increment within the costs of products isn't expansion .(TCMB, 2004 p.3) The data used in this study are quarterly CPI data. CPI data measures the price changes of goods and services purchased by the consumer. (TCMB, 2004 p.3)

4.2.2.4.1. Types of Inflation

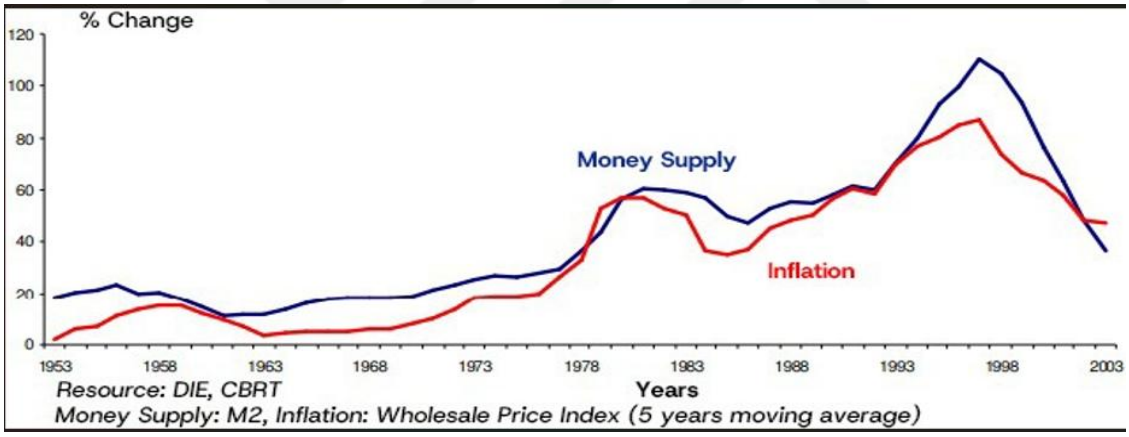
Demand Inflation is a type of inflation caused by increases in the prices of goods and services due to the supply of goods and services not keeping pace with the increase in

aggregate demand. It is encountered when the economy enters a recovery phases and the unemployment rate decreases. (TCMB, Enflasyonun Nedenleri, Retrieved: 10.05.2025)

Cost inflation is the type of inflation that occurs when production costs increase. In such cases, aggregate supply is expected to decrease and prices are expected to rise. (TCMB, Enflasyonun Nedenleri, Retrieved: 10.05.2025)

An increment in cash supply is another figure that puts upward weight on swelling by expanding venture and utilization consumptions. When the money supply increments, the sum of cash accessible for banks to loan increments, which in turn increments consumers' utilize of obligation and leads to higher utilization, which in turn leads to swelling. (TCMB, Enflasyonun Nedenleri, Retrieved: 10.05.2025)

Figure 4.2. Money Supply and Inflation



(Source*: TCMB, 2004 p.5*)

Inflation expectation is caused by the desires of buyers and makers that costs will rise within the future. Such desires lead to an increment within the costs of merchandise and administrations through wage requests**.** (TCMB, Enflasyonun Nedenleri, Retrieved: 10.05.2025)

4.2.2.5. Real Interest Rates (INR)

Genuine intrigued rate can be characterized as the intrigued rate balanced for swelling impacts. Within the consider, the approach rate and the annualized 3-month normal of the expansion information declared by TSI are utilized as the interest rate and included within the demonstrate agreeing to the Fischer strategy.

4.2.2.6. Gross Domestic Product (GDP)

GDP measures the esteem of the ultimate goods and administrations created within the nation. The data used in the study are obtained from the data provided by TSI. The data are calculated according to the expenditure method and adjusted for seasonal and calendar effects.

Table 4.1. Definition of Variables

Variable	Notation	Explanation
Dependent	ROA	$\text{ROA} = \frac{Net\ Profit\ (Loss)}{\text{Avrage Total Assets}}$
Dependent	ROE	$\text{ROE} = \frac{Net\ Profit\ (Loss)}{\text{Avrage Total Equity}}$
Dependent	NIM	$\text{NIM} = \frac{\text{Net Interest Income (Expense)}}{\text{Average Total Assets}}$
Independent	MINF	*Quarterly Consumer Price Index*
Independent	INR	$Real\ Interest\ Rate = Interest\ Rate - Inflation$
Independent	GDP	*Seasonaly and Calender Adjusted Expenditure on the Gross Domestic Product*
Independent	NPL	$NPL = \frac{\text{Gross Non} - \text{Performing Loans}}{\text{Total Cash Loans}}$
Independent	NINEX	$NINEX = \frac{\text{Non} - \text{Interest Income}}{Non - Interest\ Expense}$
Independent	IEXLC	$IEXLC = \frac{Total\ Interest\ Expense}{\text{Avarege Interest Bearing Liabilities}}$

Figure 4.3. Graph of Series

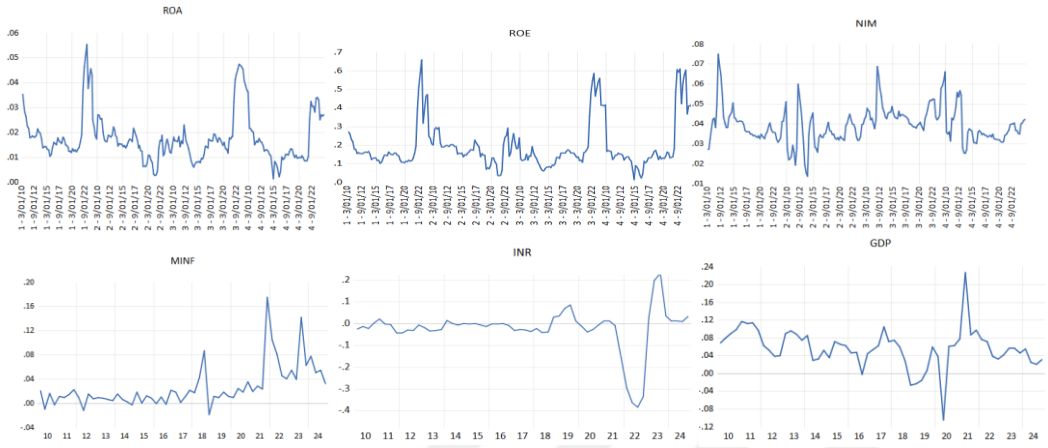


Table 4.2. Descriptive Statistics of Dependent Variables

Description	ROA	ROE	NIM
Mean	0.017800	0.194294	0.039278
Median	0.016000	0.155450	0.038150
Maximum	0.055600	0.659700	0.075000
Minimum	0.001500	0.015800	0.013700
Std. Dev.	0.009795	0.128629	0.008982
Skewness	1.524436	1.868277	0.817944
Kurtosis	5.371226	5.863235	5.037392
Jarque-Bera	149.1834	221.5995	68.27095
Probability	0.000000	0.000000	0.000000
Sum	4.272100	46.63060	9.426800
Sum Sq. Dev.	0.022931	3.954334	0.019281
Observation	240	240	240

Table 4.3. Descriptive Statistics of Independent Variables

Description	MINF	INR	GDP	NPL	NINEX	IEXLC
Mean	0.026535	-0.049115	0.057703	0.034598	0.952758	0.081422
Median	0.016150	-0.014650	0.060000	0.032000	0.974300	0.062800
Maximum	0.175600	0.086100	0.227000	0.072400	1.014700	0.291100
Minimum	-0.018400	-0.384000	-0.104000	0.009600	0.768200	0.045000
Std. Dev.	0.034644	0.101697	0.043749	0.013311	0.053868	0.052959
Skewness	2.258232	-1.926933	-0.065872	0.584345	-1.470258	2.653914
Kurtosis	8.878894	5.930175	7.810196	3.174300	4.352503	9.397533
Jarque-Bera	549.5984	234.3821	231.5535	13.96219	104.7590	691.0147
Probability	0.000000	0.000000	0.000000	0.000929	0.000000	0.000000
Sum	6.368400	-11.78760	13.84880	8.303400	228.6620	19.54127
Sum Sq. Dev.	0.026535	-0.049115	0.057703	0.034598	0.952758	0.081422
Observation	0.016150	-0.014650	0.060000	0.032000	0.974300	0.062800

METHODOLOGY

In the study, the factors affecting the profitability of Deposit Domestic Private, Deposit Public, Deposit Foreign and Participation banks operating in Türkiye between 2010 and 2024, regardless of ownership structure, are investigated. The dependent variable ROA, ROE, NIM data are obtained from BRSA data as explained in the data set section. The independent variables MINF and GDP are obtained from TSI data, while INR is calculated according to the Fischer method using TSI Sand CBRT data. The other independent variables NPL, NINEX and IEXLC are obtained from BRSA data. The study is based on quarterly data and there are 60 observations for each bank type and 240 observations in total.

Panel data analysis method is used in this study. This model was preferred both because it allows increasing the observation size by combining the time and cross-sectional numbers of the data, and because it provides convenience in terms of analyzing dynamic effects in the study. Kaya 2002, Tunay and Silpar 2006a, 2006b, Atasoy 2007, Beberlioğlu and Uzun 2019 can be cited as examples of studies conducted with this method.

Before proceeding with the panel data analysis, the stationarity levels of the series are analyzed using Levin-Li-Chu, Im, Peseran and Shin, ADF-Fischer and PP-Fisher panel unit root tests.

5.1. ADF Test Results

Table 5.1. ADF Test Result of ROA

Method	Statistic	P-Value
Levin,Li&Chu	-7.49887	0.0000***
Im, Peseran and Shin	-7.21772	0.0000***
ADF Fischer	65.0403	0.0000***
PP Fisher	105.692	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.2. ADF Test Result of ROE

Method	Statistic	P-Value
Levin,Li&Chu	-8.54066	0.0000***
Im, Peseran and Shin	-8.37377	0.0000***
ADF Fischer	78.4129	0.0000***
PP Fisher	126.388	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.3. ADF Test Results of NIM

Method	Statistic	P-Value
Levin,Li&Chu	-1.67917	0.0466**
Im, Peseran and Shin	-4.24330	0.0000***
ADF Fischer	34.9916	0.0000***
PP Fisher	21.3505	0.0063***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.4. ADF Test Result of MINF

Method	Statistic	P-Value
Levin,Li&Chu	-4.02584	0.0000***
Im, Peseran and Shin	-2.60586	0.0046***
ADF Fischer	19.5961	0.0120**
PP Fisher	84.9439	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.5. ADF Test Result of INR

Method	Statistic	P-Value
Levin,Li&Chu	1.74713	0.9597*
Im, Peseran and Shin	-4.54702	0.0000***
ADF Fischer	36.1718	0.0000***
PP Fisher	69.7608	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.6. ADF Test Result of GDP

Method	Statistic	P-Value
Levin,Li&Chu	-8.88248	0.0000***
Im, Peseran and Shin	-12.9781	0.0000***
ADF Fischer	134.038	0.0000***
PP Fisher	205.744	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.7. ADF Test Result of NPL

Method	Statistic	P-Value
Levin,Li&Chu	-4.05407	0.0000***
Im, Peseran and Shin	-5.46952	0.0000***
ADF Fischer	48.1693	0.0000***
PP Fisher	77.4976	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.8. ADF Test Result of NINEX

Method	Statistic	P-Value
Levin,Li&Chu	-12.0342	0.0000***
Im, Peseran and Shin	-11.8549	0.0000***
ADF Fischer	120.602	0.0000***
PP Fisher	152.186	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.9. ADF Test Result of IEXLC

Method	Statistic	P-Value
Levin,Li&Chu	-7.88622	0.0000***
Im, Peseran and Shin	-7.49806	0.0000***
ADF Fischer	68.6977	0.0000***
PP Fisher	76.0137	0.0000***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

The variables used in the study are stationary according to all test types except the INR variable. However, in the INR variable, the LLC method shows that the variable is non-stationary. Since the majority of the tests show that the data is stationary, it is included in our study.

5.2. Basic Panel Regression Model

5.2.1. Fixed Effects Model

$$y_{it} = \alpha_i + \beta_{xit} + \varepsilon_{it} \quad (5.1)$$

5.2.2. Random Effects Model

$$y_{it} = \alpha_i + \beta_{xit} + u_{it} + \varepsilon_{it} \quad (5.2)$$

Where;

$y_{it} = Dependent\ Variable$

$a_i = unobserved\ individual\ specific\ effect$

$\beta = Coefficients\ of\ independent\ variables$

$x_{it} = Independent\ Variables$

$\varepsilon_{it} = Error\ Term$

$u_{it} = Compound\ Error\ Term$

There are two equations in the given models. The first one is the Fixed Effects Model equation. This model is a method in which unobservable differences between individuals are included as a constant term in the regression equation. It estimates the relationship between variables based only on changes over time, assuming that all individual characteristics that do not change over time are reflected in the model in a constant way. The random effects model represents inter-individual differences with a random error term with zero mean. It estimates under the assumption that between-unit heterogeneity is not collinear with the explanatory variables. (Baltagi, 2005).

Hausman test is connected to choose which of these two models to utilize. This test tests the estimation distinction between settled and irregular impacts models and in case there's a critical relationship between person impacts and informative factors, the settled impacts

demonstrate ought to be favored. Something else, the arbitrary impacts show gives more steady and productive estimates. (Hausman 1978).

5.3. Determination of Model and Empirical Results

In the research 3 models are conducted for each of dependent variables.

$$ROA_{it} = \alpha_{it} + \beta 1 ROA_{it-1} + \beta 2 MINF_{it} + \beta 3 INR_{it-1} + \beta 4 GDP_{it} + \beta 5 NPL_{it} + \beta 6 NINEX_{it} + \beta 7 IEXLC_{it} \quad (5.3)$$

$$ROE_{it} = \alpha_{it} + \beta 1 ROE_{it-1} + \beta 2 MINF_{it-1} + \beta 3 INR_{it} \beta 4 GDP_{it} + \beta 5 NPL + \beta 6 NINEX_{it} + \beta 7 IEXLC_{it} \quad (5.4)$$

$$NIM_{it} = \alpha_{it} + \beta 1 NIM_{it-1} + \beta 2 MINF_{it} + \beta 3 INR_{it-1} \beta 4 GDP_{it-1} + \beta 5 NPL_{it} + \beta 6 NINEX_{it-1} + \beta 7 IEXLC_{it} \quad (5.5)$$

Hausman Test was conducted to choose whether to utilize Settled Impacts or Arbitrary Impact show within the indicated models.

H_0: *There is no systematic difference between Fixed and Random Effects Models*

H_1: *There is systematic difference between Fixed and Random Effects Models*

Result of Hausman tests are shared in table 21, 24 and 27 According to results, For ROA and ROE H_0 is rejected. For NIM, H_1 is rejected.

Table 5.10. Result of Hausman Test For ROA

Test Summary	Chi-Sq. Statistics	Chi-sq d.f	Probability
Period Random	**13.943394**	**4**	**0.0075**

The Period Random Effect Test was conducted to assess whether time-specific effects are significant in the panel data model. The Chi-square statistic value is 13.943 with 4 degrees of freedom, and the corresponding probability is 0.0075. Since the p-value is less than 0.05 H_0 is rejected for the equation 5.3.

Table 5.11. Random Effects Model Results for ROA

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	-0.000777	0.003149	-0.246630	0.8054
ROA(-1)	0.917253	0.024956	36.75424	0.0000***
MINF	0.026656	0.010370	2.570410	0.0108**
INR(-1)	-0.008138	0.003845	-2.116348	0.0354**
GDP	-0.000910	0.007155	-0.127116	0.8990
NPL	0.004926	0.018083	0.272430	0.7855
NINEX	0.002560	0.003411	0.750405	0.4538
IEXLC	-0.017942	0.006543	-2.742164	0.0066***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.12. Random Effects Model Summary Statistics for ROA

Statistics	Weighted Statistics	Unweighted Statistics
R-Squared	0.889824	0.895602
Adjusted R-Squared	0.886441	
S.E of Regression	0.002449	
F-Statistics	263.0589	
Prob (F-Statistics)	0.00000	
Mean Dependent Variable	0.009131	0.017667
S.D. Dependent Variable	0.007268	
Sum squared residual	0.001368	0.002350
Durbin-Watson Stats	1.926332	1.947077

Table 5.13. Fixed Effects Model Results for ROA

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.007170	0.008681	0.826084	0.4096
ROA(-1)	0.840838	0.033849	24.84093	0.0000***
MINF	0.025617	0.007393	3.464851	0.0006***
INR(-1)	-0.011992	0.003270	-3.665308	0.0003***
GDP	0.000322	0.005036	0.063918	0.9491
NPL	-0.007457	0.024689	-0.302039	0.7629
NINEX	-0.004641	0.008893	-0.521862	0.6023
IEXLC	-0.012350	0.005298	-2.330910	0.0206**

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.14. Fixed Effects Model Summary Statistics for ROA

Statistics	Value
R-Squared	**0.898520**
Adjusted R-Squared	**0.894009**
S.E of Regression	**0.003186**
Sum squared residual	**0.002284**
Log likelihood	**1027.508**
F-Statistic	**199.2179**
Prob (F-Statistic)	**0.000000**
Mean Dependent Variable	**0.017667**
S.D Dependent Variable	**0.009787**
Akaike info criterion	**-8.614474**
Schwarz criterion	**-8.453024**
Hannan-Quinn Criterion	**-8.549392**
Durbin Watson Stat	**1.856579**

According to the Durbin-Watson Stats there is no autocorrelation risk occurring in the model. R-squared is 0.8985 which means the model explains the changes in return on

asset %89.85. Standart Error of Regression is 0.0031 and supports the models' reliability. Akaile and Hannan-Quinn criterion's results indicates that the model is efficient.

The coefficient of GDP on return on asset is positive but not statistically significant. NPL and non-interest income / non- interest expense ratio have a negative effect but these effects are not statistically significant. The lagged effect of return on asset has a strong and significant positive relationship with the return on asset of the previous period. The effect of inflation on return on assets is positive and significant at 1% level. The effect of lagged real interest rate on return on assets is negative and significant at 1% level. The effect of interest expense / interest expense bearing liabilities ratio on lagged return on assets is negative and significant at 5% level.

Table 5.15. Results of Hausman Test for ROE

Test Summary	**Chi-Sq. Statistics**	**Chi-sq d.f**	**Probability**
Period Random	**23.082192**	**4**	**0.0001**

The Period Random Effect Test was conducted to assess whether time-specific effects are significant in the panel data model. The Chi-square statistic value is 23.082192 with 4 degrees of freedom, and the corresponding probability is 0.0001. Since the p-value is less than 0.05 H_0 is rejected for the equation 5.4.

Table 5.16. Random Effects Model Results for ROE

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Probability**
C	0.003465	0.037461	0.092499	0.9264
ROE(-1)	0.884895	0.026865	32.93887	0.0000***
MINF(-1)	0.890591	0.180821	4.925265	0.0000***
INR	-0.044273	0.060707	-0.729279	0.4666
GDP	0.002558	0.101020	0.025319	0.9798
NPL	-0.150892	0.216680	-0.696382	0.4869
NINEX	0.029972	0.039637	0.756174	0.4503
IEXLC	-0.351745	0.093567	-3.759268	0.0002***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.17. Random Effects Model Summary Statistics for ROE

Statistics	Weighted Statistics	Unweighted Statistics
R-Squared	0.870927	0.8885244
Adjusted R-Squared	0.866965	
S.E of Regression	0.029044	
F-Statistics	219.7784	
Prob (F-Statistics)	0.00000	
Mean Dependent Variable	0.081207	0.193966
S.D. Dependent Variable	0.079630	
Sum squared residual	0.192332	0.451502
Durbin-Watson Stats	1.985743	2.052839

Table 5.18. Fixed Effects Model Results for ROE

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.165520	0.112103	1.476505	0.1412
ROE(-1)	0.752542	0.036782	20.45955	0.0000***
MINF(-1)	0.804613	0.121478	6.623505	0.0000***
INR	-0.149443	0.048625	-3.07373	0.0024***
GDP	-0.003436	0.67073	-0.051230	0.9592
NPL	-0.445299	0.336827	-1.322039	0.1875
NINEX	-0.121672	0.114998	-1.058040	0.2912
IEXLC	-0.162570	0.08000	-2.032122	0.0433**

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.19. Fixed Effects Model Summary Statistics for ROE

Statistics	Value
R-Squared	0.892232
Adjusted R-Squared	0.887443
S.E of Regression	0.043411

Sum squared residual	0.424008
Log likelihood	411.1070
F-Statistic	186.2822
Prob (F-Statistic)	0.000000
Mean Dependent Variable	0.193966
S.D Dependent Variable	0.129392
Akaike info criterion	-3.390737
Schwarz criterion	-3.229287
Hannan-Quinn Criterion	-3.325655
Durbin Watson Stat	1.909574

According to the Durbin-Watson Stats there is no autocorrelation risk occurring in the model. R-squared is 0.8922 which means the model explains the changes in return on equity 89.22%. Adjusted R-squared 88.7% supports the model. F-Statistic confirms of the models' explaining power. Standart Error of Regression is 0.043411 and supports the models' reliability. Akaile and Hannan-Quinn criterion's results indicates that the model is efficient.

The lagged effect of return on equity has a significant positive effect on return on equity at 1% level. While the effect of lagged inlation on return on equity is positive and significant at 1% level, the effect of real interest rate on return on equity is negative and significant at 1% level. The independent variables GDP, NPL and non-interest income / non- interest expense ratio have a negative coefficient on return on equity but are not statistically significant. Interest expense / interest expense bearing liabilities has a significant effect and a negative effect at 5% level.

Table 5.20. Results of Hausman Test for NIM

Test Summary	Chi-Sq. Statistics	Chi-sq d.f	Probability
Period Random	**1.945052**	**4**	**0.7459**

The Chi-square statistic value is 1.945052 with 4 degrees of freedom, and the corresponding probability is 0.7459. Since the p-value is greater than 0.05 H_0 is rejected for the equation 5.4. This implies that time effects are statistically significant and should be taken into account in the model specification.

Table 5.21. Random Effects Model Results for NIM

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	-0.009041	0.004067	-2.222915	0.0272
NIM(-1)	0.845333	0.034498	24.50401	0.0000***
MINF	-0.007117	0.019276	-0.369221	0.7123
INR(-1)	0.004685	0.006496	0.721227	0.4715
GDP(-1)	0.026628	0.013315	1.999771	0.0467**
NPL	0.010575	0.022710	0.465683	0.6419
NINEX(-1)	0.012042	0.004561	2.640309	0.0089***
IEXLC	0.029476	0.011345	2.598119	0.0100***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.22. Random Effects Model Summary Statistics for NIM

Statistics	Weighted Statistics	Unweighted Statistics
R-Squared	0.800292	0.713275
Adjusted R-Squared	0.794166	
S.E of Regression	0.002898	
F-Statistics	130.5239	
Prob (F-Statistics)	0.00000	

Mean Dependent Variable	0.013165	0.039357
S.D. Dependent Variable	0.006388	
Sum squared residual	0.001915	0.005422
Durbin-Watson Stats	1.747447	1.730977

Table 5.23. Fixed Effects Model Results for NIM

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	-0.007770	0.012401	-0.626522	0.5316
NIM(-1)	0.751442	0.044010	17.07444	0.0000***
MINF	-0.008429	0.011068	-0.760576	0.4471
INR(-1)	0.006216	0.004049	1.535150	0.1262
GDP(-1)	0.022924	0.007715	2.971475	0.0033***
NPL	-0.039764	0.039806	-0.998954	0.3189
NINEX(-1)	0.017371	0.012543	1.384895	0.1675
IEXLC	0.021870	0.007643	2.861209	0.0046***

*Note: ***, ** and * represent statistical significance at 1%, 5%, 10% respectively.*

Table 5.24. Fixed Effects Model Summary Statistics for NIM

Statistics	Value
R-Squared	0.723303
Adjusted R-Squared	0.711006
S.E of Regression	0.004822
Sum squared residual	0.005232
Log likelihood	929.7107
F-Statistic	58.81645
Prob (F-Statistic)	0.000000
Mean Dependent Variable	0.03957
S.D Dependent Variable	0.008970

Akaike info criterion	-7.785684
Schwarz criterion	-7.624234
Hannan-Quinn Criterion	-7.720602
Durbin Watson Stat	1.657197

Durbin Watson confirms that there is no autocorrelation problem for the model. R-squared explains the 72,33% of the model. Standart Error of Regression is 0.004822 and supports the models' reliability. F-Statistic confirms of the models' explaining power. The lagged value of net interest margin has a positive and significant effect on net interest margin at 1% level. The lagged version of non-interest income / non- interest expense has a positive effect on interest margin but not statistically significant. Interest expense / interest bearling liabilities has a positive effect at the 5% level of significance, while lagged GDP has a positive effect, significant at the 1% level. The remaining variables are not statistically significant.

5.4. The Impact of Macroeconomic Variables on Dependent Variables

5.4.1. Return on Asset

As a result of the Hausman test, it is concluded that the Fixed Effects Model is appropriate for the return on asset dependent variable. In the study conducted according to the Fixed Effects Model, the positive effect of inflation was observed among the factors affecting return on asset. Results were obtained in parallel with the results of Demirgüç-Kunt & Huizanga (1999), Kaya (2002), Tunay Silpar (2006). When the real interest rate is analyzed, it is observed that its lagged version has a negative effect on return on asset. This is thought to be due to the increase in borrowing costs of banks. Another variable, GDP was found to have a positive effect on return on equity, but no statistical relationship could be established. The relationship is parallel with the Sucu (2019).

5.4.2. Return on Equity

As a result of the Hausman test, it is concluded that the Fixed Effects Model is appropriate for the return on equity dependent variable. As a result of the study conducted according to the Fixed Effects Model, it was found that the lagged effect of inflation is positive and significant at 1% level and the effect of real interest rate variable is negative but statistically insignificant. For GDP, no statistical significance is found and its effect is negative.

It is believed that this is due to the fact that depositors demand higher yields due to the increase in inflation and in response to this situation, banks demand higher interest rates for loans and products to compensate for their losses arising from inflation.

The reason for the negative increase in the real interest rate variable is that both liquidity management and funding costs are high in resource utilization, and real and legal persons demanding funds hesitate to use loans due to high interest rates.

5.4.3. Net Interest Margin

According to the results of the Hausman test, it was decided to use the Random Effects Model is appropriate for the NIM dependent variable. There is no statistical significance in the effect of inlation, real interest rate on net interest margin. The lagged value of GDP, which is another macro variable, is positively correlated with net interest margin and is significant at the 5% level. This is thought to be due to the increase in credit consumption of individuals and entities due to increased economic activity in the country. The fact that it is not clearly reflected in other profitability ratios is thought to be due to both the lag effect and the direct effect of loan interest income on the net interest margin. Net non-interest income may not have increased as much as net interest income in this period.

5.5. Interpretation of Bank Specific Variables

5.5.1. Return on Asset

The effect of NPL and non-interest income / non- interest expense ratio is negative but statistically insignificant. The independent variable interest expense / interest bearing asset ratio is found to be significant at the 5% level and its effect is negative.

5.5.2. Return on Equity

In parallel with the results obtained in return on equity, NPL and non-interest income / non- interest expense ratio were found to have a negative effect but statistically insignificant. The independent variable variable interest expense / interest bearing asset ratio was observed to be supportive of the results of return on asset and had a negative effect with significance at the 5% level.

5.5.3. Net Interest Margin

In the model for net interest margin, unlike the other indicators, the lagged effect of the independent variable non-interest income / non- interest expense ratio is positively significant at 1% level. The main reason for this is thought to be the accounting approach and the fact that in addition to products such as loans, cost packages, file fees, etc. are effectively reflected to customers. The main reason for this is thought to be the accounting approach and the effective reflection of products that include commission such as cost packages, filing fees, etc. to customers. The effect of and non-interest income / non-interest expense ratio variable on interest margin is positive and significant at 1% level. It has a statistically insignificant but positive coefficient with NPL.

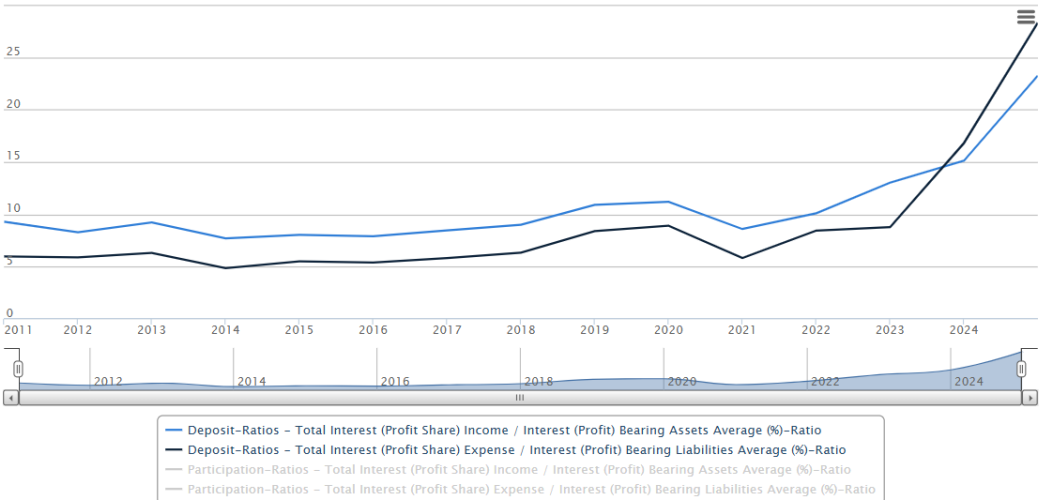
Despite the positive relationship and significant statistical result between and non-interest income / non- interest expense ratio and Net interest margin, there is a need to explain why there is a negative effect on return on asset and return on equity, and explanations

are made under the overall interpretation to further elaborate the effects of all independent variables.

5.6. Overall interpretation of the Findings

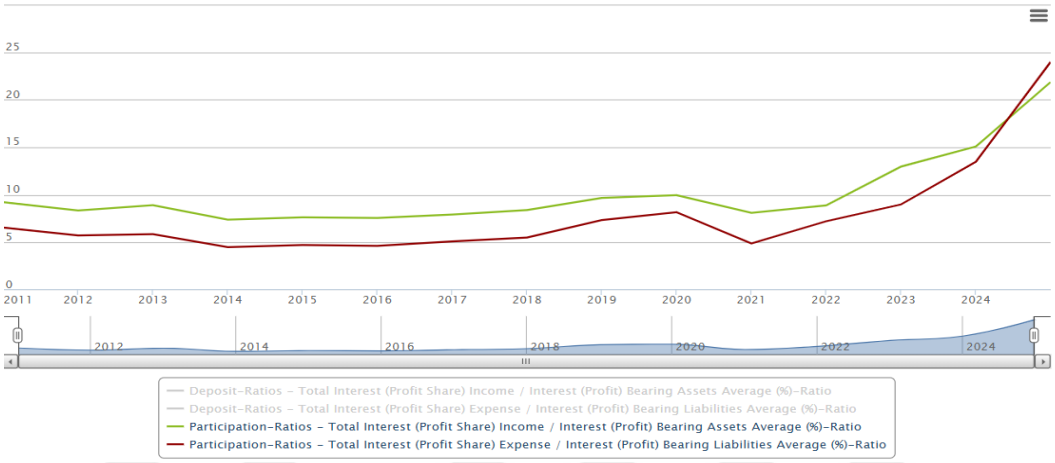
To elaborate on this point, it is assumed that as the ratio of interest expenses to interest-bearing liabilities increases, the ratio of interest income to interest-earning assets also rises. In this way, banks are expected to maintain a spread and generate interest income. Therefore, since the present study only takes into account the ratio of interest expenses to interest-bearing liabilities, the results are interpreted accordingly. The figures below present the annual data for deposit and participation banks from 2010 to 2024 regarding the ratios of non-interest income to average interest-bearing liabilities, and interest income to average interest-earning assets.

Figure 5.1. Interest Income / Interest Expense Ratios (2010-2024 annual basis Deposit Banks)



(Source: *BRSA, Advanced Analysis*)

Figure 5.2. Interest Income / Interest Expense Ratios (Participation Banks)



(Source: *BRSA, Advanced Analysis*)

It is observed that there was a noticeable spread between the two ratios up until 2023. However, in 2024, this margin appears to have weakened, partly due to the increase in banks' interest expenses. During 2024, interest-bearing liabilities were observed to remain at relatively higher levels in the ratio. Nevertheless, banks still generated positive net interest income. This can be attributed to the fact that banks' interest-earning assets continued to exceed interest-bearing liabilities. In the year when the ratio peaked (2024/12), total interest-earning assets amounted to approximately TRY 25.5 trillion, while total interest-bearing liabilities reached around TRY 17.5 trillion. Therefore, even though the gap between the ratios might appear negative, banks were still able to generate interest income due to the relatively higher share of interest-earning assets.

Moreover, this supports why inflation has affirmative coefficient in the models for return on asset and return on equity. Fund providers demand higher rates of return to compensate for losses due to inflation. Likewise, banks demand higher interest rates from real and legal person demanding funds in order to compensate for losses due to inflation. However, since the monetary amount of interest-earning assets is higher, banks' profitability is thought to increase.

In this case, why does the independent variable interest expense / interest bearing liabilities ratio have a negative effect on return on asset and return on equity ? It is

believed that the main reason for this problem stems from the recording method and the lagged effect of the variable has an effect on the dependent variables return on asset and return on equity.

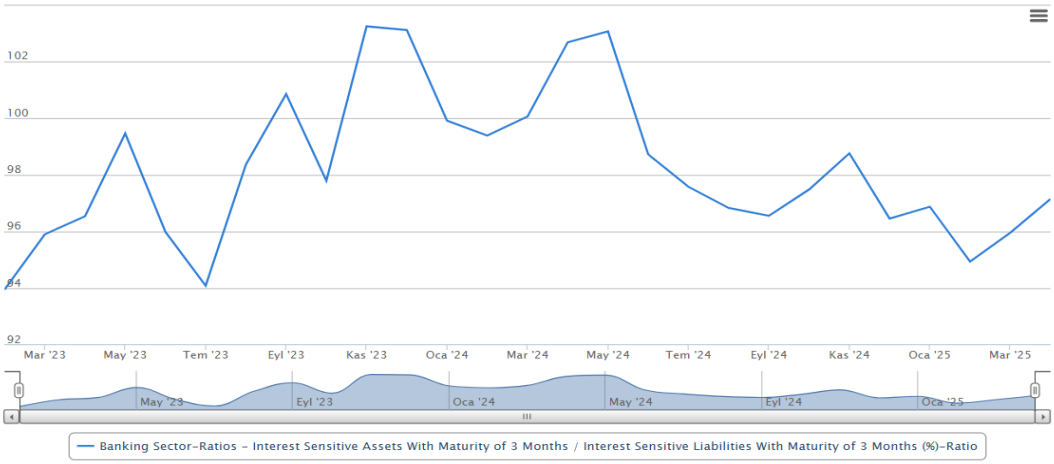
Also the relationship between NPL ratio and net interest margin is interesting. The interest income component included in the interest income part of the income statement is recorded on an accrual basis. For instance, in the case of a 12-month loan with monthly installment payments, the interest income is recorded as it accrues. If the borrower becomes unable to repay the loan after the sixth month, the accrued interest up to that point will still be reflected under interest income. However, the provisions allocated for the remaining six months are not recorded under interest expenses, and therefore their effect on net interest margin is likely to be limited. Moreover, it should be taken into account that loans are continuously extended across quarterly periods, leading to a steady increase in interest income. On the other hand, provisions recorded as non-interest expenses directly explain the negative impact of NPL on other profitability indicators which are return on asset and return on equity.

In the UCA established by BRSA for deposit and participation banks, this item is recorded under account number “820”. According to the UCA used by banks in Türkiye, accounts starting with “5” represent interest income, those starting with “6” represent interest expenses, accounts beginning with “7” correspond to non-interest income, and those beginning with “8” represent non-interest expenses.

It would be incorrect to interpret a positive relationship between the NPL ratio and the net interest margin as favorable, since a deterioration in asset quality typically results in a decline in interest income, thereby negatively affecting the interest margin. The findings actually point to several important indicators. Specifically, results may indicate that during the 2010–2024 period, NPL ratios in Türkiye remained at reasonable levels and that the banking sector maintained a strong capital structure. Otherwise, the net interest margin would likely have been adversely affected, and due to weakening capital adequacy, a decline in lending volumes could have reduced interest income, which in turn would have led to a contraction in the net interest margin.

To elaborate on why real interest rates, have a negative impact and why the ratio of interest expenses to interest-bearing liabilities shows a positive effect with a lag, it is considered that the ratio of interest-sensitive assets with a maturity of 3 months to interest-sensitive liabilities with a maturity of 3 months serves as an explanatory metric. This ratio reflects the repricing gap between short-term assets and liabilities, thereby helping to assess the timing and direction of interest rate impacts on net interest margins. In this case, Sensitive Assets with maturity of 3 Months and interest sensitive Liabilities with Maturity of 3 Months ratio may guide the research.

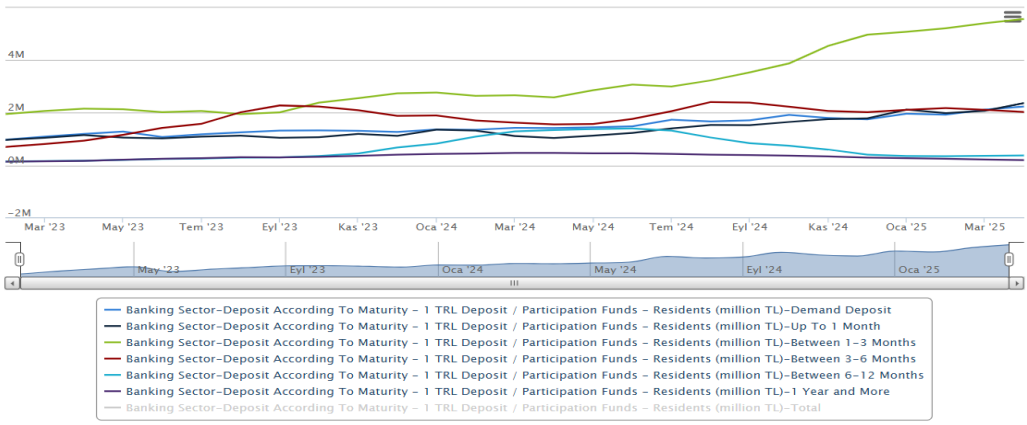
Figure 5.3. Interest Sensitive Assets With Maturity of 3 Months / Interest Sensitive Liabilities With Maturity of 3 Months



(Source: *BRSA, Advanced Analysis*)

The decline observed from mid-2024 through the final quarter is believed to be primarily driven by real interest rates. Due to expectations that inflation will decrease in 2025, banks have offered lower interest rates on long-term deposits compared to short-term ones. This shift has led to changes in the liability structure of the balance sheets.

Figure 5.4. TL Deposit According to Maturity (2023 January-2025 March Monthly)



(Source: *BRSA, Advanced Analysis*)

As shown in Figure 9, during the relevant period, there was an increase in Turkish lira time deposits with maturities of 1 to 3 months, while deposits with maturities of 6 to 12 months declined. Simultaneously, a noticeable decrease was observed in non-interest-bearing demand deposit accounts. This indicates that the rise in short-term interest rates became more attractive to fund holders. This development also provides a clearer explanation for the negative effect of the real interest rates independent variable, while supporting the delayed impact and varying results associated with the interest expense / interest bearing liabilities ratio. Moreover, it helps to explain why the margin between interest expenses and interest-bearing liabilities has narrowed rapidly in recent periods.

CONCLUSION

This study presents a contemporary analysis by examining the factors that determine bank profitability during the 2010–2024 period. The point of this consider is to recognize the components that impact benefit of Turkish banks which works in Türkiye. The examination is based on quarterly data from banks in Türkiye for the period between 2010 and 2024. The information for banks are categorized by proprietorship structure as; residential, state owned, and participation banks whereas support banks are included within the examination without respect to possession sort due to their restricted number. The study employs panel data analysis, a method frequently used in literature, due to its suitability for dynamic modeling and its ability to account for lagged effects. Before estimating the model, unit root tests were conducted using the Levin, Lin & Chu, Im–Pesaran–Shin, ADF-Fisher, and PP-Fisher methods. To determine whether to use a Fixed Effects or Random Effects model, the Hausman Test was applied. Based on the test results, the Fixed Effects model was selected for the models where Return on Assets and Return on Equity are the dependent variables, while for the model with net interest margin as the dependent variable, a different structure was preferred. As observed in the literature review, this topic has been tested multiple times using both macroeconomic indicators and bank-specific variables. The review reveals a wide range of findings. These differences are thought to stem from variations in the models used, datasets, observation periods, sample sizes, and the types of banks analyzed. In the second part of the study, it was observed that throughout history, banks have been shaped and influenced by both political and economic developments. Therefore, the economic and political dynamics of each period may have had varying impacts on banks over time.

In this study, inflation was found to have a positive effect on return on assets, which is consistent with the findings of Demirgüç-Kunt & Huizinga (1999), Kaya (2002), and Tunay & Silpar (2006). Regarding the real interest rate, its lagged version was found to have a negative impact on ROA. This is likely due to higher borrowing costs for banks and increased credit costs for borrowers, which may lead to more cautious borrowing behavior. Similar results were observed for ROE as the dependent variable. Consistent

with Güneş (2015), GDP was found to have no statistically significant effect on either return on asset or return on equity in both models. However, its lagged effect on net interest margin was found to be positive and statistically significant.

Among the bank-specific variables, non-interest income / non- interest expense ratio and interest expense / interest expense bearing liabilities were used deliberately, as they are not frequently encountered in the literature, and were expected to contribute a different explanatory perspective. Although non-interest income / non- interest expense ratio did not have a statistically significant effect on return on assets and return on equity, a lagged positive effect on net interest margin was observed. For interest expense / interest expense bearing liabilities, the lagged effect was positive, while the contemporaneous effect was negative. This is thought to be due to the fact that as the ratio of interest expenses to interest-bearing liabilities increases, the ratio of interest income to interest-earning assets also rises, allowing banks to preserve the interest margin and generate income.

No statistically significant relationship was found between the NPL ratio and profitability indicators, although the contradictory directions of the coefficients were explained with reference to accounting reasons.

While banks are observed to be vulnerable to external factors beyond their control, it remains crucial for them to strengthen internal weaknesses and enhance operational efficiency. In this regard, academic studies enriched with more diverse variables can support more rational decision-making in bank management, and contribute to the identification and control of manageable risks.

It ought to moreover be famous that, due to the huge organizational structures of banks, representatives frequently come up short to get a handle on the broader picture. This think about points to fulfill the interest of people who are energetic almost the keeping money calling and to serve as a valuable asset for those who wish to conduct investigate in this field within the future.

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