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TURKISH BANKS' NON-INTEREST INCOME AND THE IMPACT OF THE CBRT REGULATIONS

TÜRK BANKALARININ FAİZ DIŞI GELİRLERİ VE TCMB YASAL DÜZENLEMELERİNİN ETKİSİ

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Abstract

Banks, which serve to facilitate the transfer of funds between deficit and surplus positions, seek to maximize their income in order to maximize their profits. In order to achieve this, banks attach great importance to the generation of non-interest income as well as interest and fee income, which represent their primary sources of revenue. In this study, we analyze the impact of potential determinants of non-interest income in the Turkish banking sector on non – interest income using a panel data set. Accordingly, this study analyses the determinants of non-interest income in the Turkish banking sector using a data set of 19 banks and 11 years. The analysis demonstrates that bank-specific variables, including the net interest margin, loans-to-assets ratio, asset growth rate, capital adequacy ratio, return on equity, and the inflation rate, significantly and negatively impact non-interest income. In contrast, changes in the return on assets and gross domestic product have a positive and significant effect on primary income. Furthermore, the CBRT's regulations on fees, charges and commissions in 2020 are anticipated to influence the non-interest income ratio of the Turkish banking sector, particularly that of public banks. Moreover, the study may also contribute to the academic literature on potential regulatory policies that could impact the primary income of banks.

Keywords: Fee Income, Non-interest Fee Income, Net Interest Margin, Panel Data Analysis

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Öz

Fon açığı ve fon fazlası olanları bir araya getiren bankalar, karlarının maksimizasyonu amacıyla gelirlerini de maksimize etmek isterler. Bu amaçla temel gelirleri olan faiz ve temettü gelirlerinin yanı sıra faiz dışı gelir getirici hizmetlere de büyük önem vermektedirler. Çalışmada Türk bankacılık sektörünün faiz dışı gelirlerinin temel belirleyicileri olabilecek faktörlerin faiz dışı gelirler üzerindeki etkisi panel veri kullanılarak bir veri seti üzerinde analiz edilmiştir. Buna göre, Türk bankacılık sektöründe faiz dışı geliri belirleyen faktörler, 19 banka ve 11 yıllık bir veri seti kullanılarak analiz edilmiştir. Analiz, net faiz marjı, kredilerin aktife oranı, aktif büyüme oranı, sermaye yeterlilik oranı, öz kaynak karlılığı gibi bankaya özgü değişkenler ile enflasyonun faiz dışı gelir üzerinde önemli bir negatif etkiye sahip olduğunu göstermektedir. Buna karşın; aktif karlılık oranı ve gayrisafi yurt içi hasıladaki değişimlerin ise faiz dışı gelir üzerinde pozitif anlamlı bir etkiye sahip olduğu görülmüştür. Ayrıca, TCMB'nin 2020 yılında ücret, masraf ve komisyonlara ilişkin düzenlemelerinin, özellikle kamu bankaları olmak üzere, Türk bankacılık sektörünün faiz dışı gelir oranını etkilemesi öngörülmektedir. Çalışmanın, bankacılık sektörü için bir düzenleme seti geliştirirken, düzenleyici otoriteler tarafından bankaların faiz dışı gelirlerini etkileyebilecek olası politikalara ilişkin literatüre de katkı sağlayabileceği değerlendirilmektedir.

Anahtar Kelimeler: Ücret Geliri, Faiz Dışı Gelir, Net Faiz Marjı, Panel Veri Analizi

1. Introduction

For a number of years, the banking system in Türkiye has been considered to be the largest player in the domestic banking system. The banking sector's balance sheet assets have been growing along with the gross domestic product (GDP) of Türkiye over the years, and Turkish banks continue to serve as the main source of finance for individual and corporate customers. In addition, the importance of non-bank financial institutions and financial technology companies is growing by the day. The continuity of traditional banking and the continuation of new products and services; It can continue with the increase in banking revenues. As the product diversifies, banking income increases; As competition increases, there are developments in favor of the end user.

In this process, non-interest income is becoming increasingly important and bank business models are undergoing structural change (Lepetit et al., 2008). It is observed that, especially in periods when interest margins decrease, banks compensate for the loss of interest income by diversifying their non – interest income. Non-interest income constitutes 20% of the total banking income for the last 10 years. As regards income from non-interest banking activities, loans that generate both interest and non-interest income and fees received on loans, which are defined as non-interest income, accounted for approximately 4.4% of total operating income in 2002.

When banking fee and commission regulations made abroad are examined, it is seen that they are generally determined during the deregulation process, that is, they are not subject to any regulation. Indeed, in the developed European and American markets, leaving the regulation of fees and commissions to market dynamics instead of strict rules has minimized the fees with competitive market functioning, allowing more companies to carry out banking transactions and making many transactions free of charge. Among the developing countries, including Türkiye, Türkiye stands out as the country

where the fees and commissions that banks receive from financial consumers or commercial customers are regulated in the most detailed legislation. It is possible to say that such legislation is regulated with the aim of protecting unconscious financial consumers in our country, where changing needs, reliable regulation of markets and especially the literacy rate are low compared to developed countries. Consequently, our study represents a pioneering investigation in Türkiye, constituting a pivotal element in the assessment of the efficacy of the recently introduced regulatory framework.

In this study, the main determinants regarding non-interest income are estimated using panel data analysis and econometric models and the prediction results are analyzed using data from selected banks in the Turkish banking sector for the period 2011-2021. In the analysis, variables specific to banks such as net interest margin, loan ratio, profitability ratios, capital adequacy ratio, asset growth rate and macro variables such as inflation and gross domestic product are analyzed for their effects on banks' non-interest income. In this respect, the study examines the hypothesis that the factors mentioned previously are among the determinants of banks' non-interest income. As a result, bank-specific variables such as net interest margin, credit rate, equity profitability ratio, asset growth rate and capital adequacy ratio and inflation macro variable have a negative significant effect on non-interest income, while changes in asset profitability ratio and gross domestic product have a positive significant effect. In addition, it was observed that the Central Bank of the Republic of Türkiye regulations on fees, expenses and commissions, which came into force in 2020, had a strong effect on the non-interest income ratio of the Turkish banking sector, especially for public banks.

The other parts of the study proceed in the following order. In the second part, a detailed examination of non-interest income and banking sector ratios will be evaluated, in the third part, domestic and international literature trying to explain non-interest income will be included, in the fourth part, a model will be established and its results will be evaluated, and in the fifth part, possible policy recommendations will be made by evaluating the results of the study.

2. Turkish Banking Sector Non-Interest Income

2.1. Non-Interest Income

As the progressive technology evolve and markets participation of rates rise all around the world, reduces transaction fees for users by eliminating asymmetric information. As a result of this, it has caused banks to go out of the classical understanding, which is defined as the purpose of establishment of banking, which foresees that banks act as an intermediary between deposits and loans. The banks' efforts to turn to the non-traditional side, to provide needed services by developing different products, to connect with customers for different reasons, led to the emergence of new services and products, and thus non-interest income was born. This situation has become widespread over time due to the reasons such as meeting the market needs and reaching high profitability levels and is positioned above the traditional understanding.

While banks transfer funds from those with excess funds to those with fund deficits through the credit mechanism, they generate income under various items as a result of these activities. At this point, although the main aim of banks is to generate sustainable income, it is extremely important that the profit obtained is sustainable. Accordingly, a large portion of the basic income earned by banks consists of interest income. Non-interest income is an important element for banks, besides their main income source, interest income, and all income earned is reflected in banks' financial statements. The calculation of non-interest income in bank balance sheets by the Banks Association of Turkey (BAT) is as follows:

Non-Interest Income = Net Fee and Commission Income/Expense + Dividend Income + Trading Profit/Loss + Other Operating Income (BAT, 2016).

2.2. Legislation

Between 1980 and 1999, when high inflation prevailed in Türkiye, banks obtained most of their resources from interest income and did not make much effort to develop new products. In the said periods, the banks' acting with the understanding of "collect deposits and lend to the government" caused them to display an understanding that is far from real banking activities and focused on profitability. In these periods, banks entered the race to collect deposits in order to further enlarge their assets consisting of treasury papers. Concern that it would be difficult to recycle the collected deposits by making them available as loans to the markets, led banks not to extend loans, but instead to invest in risk-free and high – interest Government Domestic Debt Securities.

After the 2000s, with the advancement of technology, the decrease in inflation and interest rates, and the decrease in bank profit margins, banks started to offer real banking services that are not sourced from the treasury in order to prevent income losses and entered the race to develop new customer-oriented services. The fact that banks start to charge expenses and service fees from the banking services they have developed or newly offered (transfer, EFT, check and promissory note, investment, loans, credit card, foreign currency transactions, safe rental, capital market and derivative transactions, etc.) contributed to an increase in the share of non-profit income. The service and expense fees received have become an important competitive tool for banks. While the interest rates of banks on housing loans are at about the same level with each other, their differentiation with the commission fees they receive has created the reason why it is preferred by the customers.

Looking at the regulatory history of non-interest income, the Procedures and Principles Regarding Non-Interest Fees, Commissions and Costs from Financial Consumers Regulation, which entered into force in 2014 by the Banking Regulation and Supervision Agency (BRSA), limits the fees, charges and commissions that can be charged to financial consumers to 20 fee items. The authority previously held by the BRSA has been transferred to the Central Bank of the Republic of Türkiye (CBRT) as amended by the Law of 2020. The amendment to the Banking Law gives the CBRT the power to regulate the fees that can be charged to commercial customers. With the regulations made

by the CBRT in March 2020, the fees that can be collected from financial consumers and commercial customers were regulated and limitations were imposed on some items. Within the scope of the regulations, some of the charges that may be levied on financial consumers are as follows: Allocation fee, expertise fee, electronic fund transfer fee, FAST fee, credit card annual membership fee, safe deposit box fee. The fees restricted by the relevant regulation are given in the table below.

Table 1. Fees limited by the Communiqué on Financial Consumer Fees

Fees	Limitations
Allocation fee	0,50%
Expertise fee	Paid to 3rd party
Securities pledge fee	Paid to 3rd party
EFT fee	Fixed fee by channel and amount basis
Remittance fee	Half of EFT fee
FAST fee	Fixed fee by channel and amount basis
Cash advance withdrawal fee	1%
Reporting fee	Paid to 3rd party
Transaction fee from another bank's ATM	Paid to Other Organisation + 15%

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On the other hand, some of the fees that can be collected from commercial customers consist of fees such as loan allocation fee, membership fee, blockage resolution fee, cash advance fee. The restricted fees that can be charged to commercial customers are shown in Table 2.

Table 2. Fees limited by the Communiqué on Commercial Customer Fees

Fees	Limitations
Loan allocation and loan allowance fee	Allocation 0.0025% (Half at Renewal) – Disbursement 1.10%; [Allocation 0.25%; Half at Renewal] [Disbursement 1.10%; <1 Year – Proportionally Reduced]
Expertise fee	Paid to 3rd party + 15%
Cash loan repayment fee	Less than 24 months 1% – More than 24 months 2% – Foreign currency loans with 1 point plus
EFT / FAST fees	Fixed fee by channel and amount basis
Remittance fee	Half of EFT fee
Reporting fee	Paid to 3rd party
Cash advance withdrawal fee	1%
Member Business Fee – Advance / Instalment	Reference Ratio (Maximum 3.11) + 0.45; Cards issued abroad 1.90
Blockage Resolution Fee	(Remaining Blocked Days/40) * Member Business Fee
Account to Account Business Payments Fee	No fee can be charged to the sender.

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2.3. Basic Outlook for Non-Interest Income

While it is reported in banks' income statements, non-interest income is presented as follows; it consists of commissions and fees received on loans, income from banking services, active dividends, income from asset sales and other non-interest income. Accordingly, the fees, charges and commissions earned by banks from consumer loans, commercial loans and other loans, allocation fees, appraisal fees, mortgage fees, etc. Fees and commissions income from loans have increased over the years. Accordingly, fee income from loans, which was TL 3.8 billion in 2011, reached TL 68.7 billion by the end of 2023. On the other hand, revenues from banking activities also increased steadily in the selected years, and the banking service income, in 2011 amounting to TL 13.3 billion, reached TL 361.6 billion by the end of 2023. In the same period of time, non-interest income of the Turkish banking sector increased from TL 26.6 billion to TL 724.6 billion.

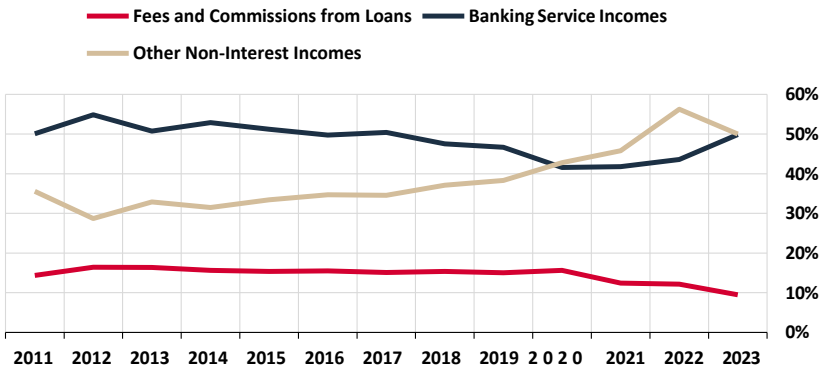

Chart 1. Composition of Non-Interest Income

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As indicated in Chart 1, as regards the share of these components in total non-interest income, fees and commissions received from loans accounted for 15 percent of total non-interest income on average, while this ratio dropped to 9 percent at the end of 2023. During the same period, banking services income accounted for an average of 49% of total non-interest income. On the other hand, the proportion of banks' other non-interest income in total non-interest income is increasing over the years, reaching 50 percent in 2023. On this basis, it is estimated that almost one-half of the total non-interest income of the banking sector is derived from the provision of banking services. It can be seen that banks' income from banking services is below average between 2018 and 2023, and in particular, due to the pandemic effect, the share of banks' income from banking services in their total non-interest income is below average in 2020 and 2022, respectively at 42 and 44 percent.

Chart 2 shows the non-interest income of the banking sector in Turkey, including fees, expenses and commissions, and the share of income derived from banking services in total income for the years 2011 – 2023. As illustrated in the graph, the proportion of fees, commissions, and income

from banking services. in total income was above average at 14.5 percent in 2011. It is evident that the proportion of these incomes in the total income decreased in subsequent years. In 2023, their weight in the total income was 11.65 percent. Especially after the introduction of restrictions on fees and commissions in 2014, it is possible that the share of fees, commissions and income from banking services in total income may have decreased as a result of the decrease the proportion of income from non-interest activities to total income and, on the other hand, the increase in income from the main activity. The decrease in the ratio of these incomes in total revenues has accelerated since 2020, when the CBRT regulations were put into effect, especially due to the restrictions imposed on fees and pandemic conditions, and this ratio decreased to the lowest level of 9.22% in 2022.

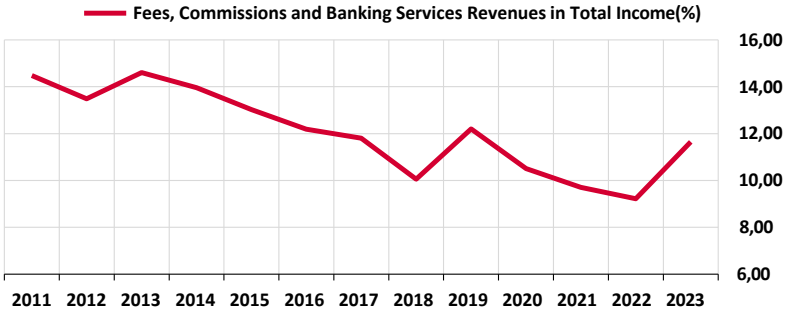

Chart 2. Share of Fees, Commissions and Income from Banking Services in Total Income
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3. Literature

The objective of the study is to contribute to the literature on which variables have an impact on the non-interest income of the banks operating in the Turkish banking sector and in which direction. The results of the study are largely consistent with the literature. This study provides a large dataset to examine whether the CBRT legislation imposing wage restrictions has had a significant effect on non-interest income since its enactment. In this respect, the study is expected to contribute to the literature and be useful for future studies with a larger data set. In addition, the study is expected to contribute to future studies by enabling a comparison with other countries in terms of the main determinants of primary income of the Turkish banking sector. Studies investigating the main determinants of non-interest income generally analyze the correlations between bank-specific variables. Accordingly, the main studies in the international and national literature on non-interest income are as below.

Hahm (2008) in his study with a dataset of 662 relatively large commercial banks in 29 OECD countries from 1992 to 2006, observed that banks with relatively large asset sizes, low net interest margins, high impaired loan ratios, and high cost-income ratios tend to exhibit higher non-interest income shares with using OLS and random effect panel estimation methods. Furthermore, it

was concluded that the share of banks' non-interest income in their total income increases when economic growth is relatively slow and inflation is stable.

Craigwell and Maxwell (2006) in their study examined the relationship between non-interest income and financial performance at commercial banks in Barbados. Their findings emphasized that noninterest income increases are associated with increased bank profitability as well as higher earnings volatility.

Tshweneyagae (2016) analyzed the main determinants of non-interest income. In his study, inflation, GDP growth, the number of ATMs, and the ratio of debt to assets had a negative relationship with non – interest income, while the logarithmic value of banks' size and return on assets positively affect non-interest income.

Thatch et al. (2022) investigated the determinants of non-interest income of state-owned banks in Vietnam for the period 2010 to 2019. Their findings underlined that non-interest income was significantly affected by the net interest margin, the cost-income ratio, political stability and the absence of violence, the interest rate and the competition factor, which was the HHI.

Meyappan (2017) conducted a study to analyze the determinants of non-interest income for CIMB Bank and RHB Bank, which were Malaysian banks, between 2004 and 2015. The study intended to determine the relationship between non-interest income and bank size, total loans, total equity, net interest margin and inflation in the short and long run. According to the study, it was found that the major determinants of CIMB Bank's non-interest income in the long run were bank size, shareholders' equity, net interest margin and inflation rate, while the determinants of RHB Bank's non-interest income were only bank size and net interest margin. It was indicated that this difference may be due to the banking policies and various product preferences of the banks.

Alkan and Şengül (2022), in their study investigated the effect of the change in CBRT M2 money supply and the weighted average cost of funding on the non-interest income of 18 deposit banks in Turkey between 2011 and 2020, concluded that as the weighted average cost of funding increased, the ratio of banks' non-interest income to total income decreases, while the change in M2 money supply increased banks' non-interest income ratio.

The non-interest income of banks in Jamaica between 1999 and 2010 was analyzed using the panel data method and the same directional relationship between the financial performance of large banks and their non-interest income was included (Bailey-Tapper's, 2010). The study found that variables such as increase in the number of ATMs, deterioration in loans, increase in customer loans and increase in investment ratio were significant variables affecting non-interest income.

Using data from 24 commercial banks in Türkiye between 2006 and 2014, Özek (2017) analyzed the characteristics of banking institutions to explain the cross-sectional differences in non-traditional activities and funding structures and found that fee and commission income had a positive but weakly

significant relationship with inflation, whereas there was a statistically insignificant relationship between bank fees and commission income and return on assets.

The effect of non-interest income of large-scale banks on bank performance was examined and found that the effect of non-interest income of large-scale deposit banks in Turkey on profitability performance is in the same direction (Kara et al., 2021).

In their study, it was examined the effect of income source diversification on the performance of 21 deposit banks operating in in Türkiye between 2010 and 2018 (Kayran & Kıyılar, 2021) . According to the results of the analysis, it was found that the diversification of banks' income sources contributed positively to their performance. When the analysis results were examined in terms of control variables, it was concluded that capital adequacy ratio, liquidity ratio and provisioning ratio had a significant effect on banks' profitability.

Lepetit et.al (2008) in their studies focused on European banks and they found income diversification to raise bank risk. In their study, they divided non-interest income into 3 parts and analyzed the results separately for commission income, fee income and income from trading activities in both large and small banks. They found that fee and commission income was related to bank risk, especially for small banks.

In a study involving the years 1989 and 2001 in the field of commercial banking in the USA was found that there was a relationship between technological developments and non – interest income (De Young and Rice, 2004). In the study, it was observed that technological developments had a dampening effect on banks' non-interest income streams. In this respect, it was observed that well-managed banks generated relatively more non-interest income.

Stiroh and Rumble (2006) concluded in their study that there was an increase in the net non-interest income of relatively large commercial banks in the US, which was engaged in non-traditional banking activities in contrast to traditional banking activities.

Köhler (2013) analyzed the effect of non-interest income of banks in Germany on banking risk for the period 2002-2010. In the study, the effect of non-interest income on the risk related to the bank's business model was determined using regression estimators. The results highlighted that investment banks and other commercial banks become more stable when they increase their noninterest income.

Engle et al. (2014) showed that regulating to limit non-interest income did not necessarily reduce bank systemic risk in 191 large international banks between 1996 and 2010. In their study, they demonstrated that the relationship between bank diversification and systemic risk is not homogeneous. Furthermore, they defined concentration as affecting the level and type of non-interest income activities chosen by banks.

Boungou and Mawusi (2022), using a large panel data set consisting of 3913 banks operating in 9 countries between 2009 and 2018, determined that the economic policy uncertainty had no

significant effect on banks' non-interest income activities. This inefficiency was mainly due to the decrease in gross non – interest expenses in parallel with the decrease in gross non-interest income.

Rogers and Sinkey (1999) in their study analyzed the size, profitability and net interest margin of banks with non-traditional activities using a panel data set of US banks between 1989 and 1993 and observed that banks with higher levels of non-traditional activities tend to be larger, have smaller net interest margins, have relatively fewer core deposits and exhibit less risk. Furthermore, they revealed that banks with higher non-interest income have lower net interest margins.

Brunnermeier et al. (2020) found in their study that banks with higher non-interest income contribute more to systemic risk, banks with higher leverage and non-performing loans increase systemic risk, while banks with higher liquidity and interest income reduced systemic risk, and they found that non-interest income was negatively related to interest income.

Williams and Rajaguru (2012) studied the relationship between fee income of Australian banks and bank net interest margins. It argued that increases in banks' fee income support the decline in net interest margin. In addition, in cases where the share of interest income in total income decreases due to high competition, it was also revealed that this decrease could be compensated by charges and commissions.

In their study, Damankah et al. (2014) stated that smaller banks have shifted their activities to non – interest earning activities instead of interest earning activities compared to larger banks.

Pennathur et al. (2012) in their research on the impact of the determinants of non-interest income on various profitability and risk measures for public sector, private domestic and foreign banks in India over the period 2001-2009, in their study document reveal that banks with higher public ownership are less likely to pursue non-interest income sources. On the other hand, they observed that state-owned banks generate less fee income compared to private domestic banks. They also stated that fee-based income significantly reduces the risk to the profitability of state-owned banks.

It was observed that a shift to non-interest activities increases bank profits and risk-adjusted profits, especially when banks become more involved in government bond trading, in a study focusing on the impact of bank revenue diversification on bank performance in emerging markets (Meslier, 2014).

Using the data of 28 banks in Cambodia analyzed the relationship between bank net interest margin and non-interest income between 2004 and 2010, found that the increase in non-traditional activities of banks is associated with a decrease in net interest margin and vice versa and that non-traditional activities have a positive correlation with net interest margin in the post-financial crisis period (Vithyea, 2014).

Le (2017), in his study investigating the relationship between non-interest income and net interest margin in the Vietnamese banking system between 2006 and 2015, showed that there was a negative correlation between net non-interest income and net interest margin and that during economic

depressions, banks could use net non-interest income to expand leverage by coordinating net non-interest income strategy.

The relationship between bank performance and non-interest income in the Asian region with 24 bank data between 1996 and 2018 was analyzed and showed that for the Asian region, especially considering the 2008 crisis, bank riskiness decreased in the years when interest income increased rather than non-interest income after the crisis (Antao & Karnik, 2022).

It was analyzed the impact of economic policy uncertainty on non-interest income using the data of 634 banks operating in India between 2004 and 2020 using the dynamic GMM model and found that economic policy uncertainty has a positive effect on non-interest income of banks (Shanmugam, 2023). It also found that bank mergers and acquisitions had no effect on the bank's non-interest income ratio and that bank size had no significant effect on non-interest income.

In the study with 16 banks between 2005 and 2016, it was found that credit quality negatively affects non-interest income (Zenebe, 2018). On the other hand, it was revealed that non-interest income had a positive relationship with bank size, bank efficiency and bank liquidity.

Using data on 35 commercial banks for the period 2003-2012, observing that there was a positive correlation between non-interest income of commercial banks in Kenya and bank size, while inflation, GDP growth and technological developments had a negative correlation with non-interest income (Atellu, 2012).

4. Model Specification

4.1. Data Set

The study analyzed the correlation between the ratio of non-interest income and the main factors considered to be the main drivers of this income, using annual financial data of 19 banks operating in the Turkish banking sector between 2011 and 2021. The banks included in the study are generally deposit banks, and participation banks and investment and development banks are not included in the data set. Since the entire data set of banks for the years examined in the study is included, it features balanced panel data. The data included in the analysis was obtained from the statistical information section on the official website of BAT and the official website of the Turkish Statistical Institute (TURKSTAT) providing statistical information.

4.2. Methodology and Descriptive Statistics

The framework used to evaluate the interaction between non-interest income and banks' specific financial variables and macroeconomic variables is taken from studies of De Young and Rice (2004) and Craigwell and Maxwell (2005). The model captures the impact of measures of bank characteristics,

inflation and GDP on non-interest income. We also consider the Engle et al. (2014) study when building the model.

In the first model, variables that could be the main determinants of non-interest income were selected in accordance with the literature. In the second model, in addition to heterogeneous changes specific to banks, macroeconomic variables were also included in the model and significant results were found. Inflation and gross domestic product variables, which are commonly used in studies where non-interest income determinants were determined in accordance with the literature, were used. In the third model we just look how it affects the public banks non-interest income before the regulations. In the third model, in addition to the variables in question, the possible effects of the mentioned legislative changes on the non – interest income ratio will be tested by adding dummy variables to the banks that are public banks among the banks included in the analysis and the legislative changes regarding the fees and commissions put into effect by the CBRT in 2020.

MODEL1: $NIIit = B0 + B1(NIM)t + B2(CRR)t + B3(ROA)t + B4(CAR)t + B5(ROE)t + B6(GRW)_t$

MODEL.2: $NIIit = B0 + B1(NIM)t + B2(CRR)t + B3(ROA)t + B4(CAR)t + B5(ROE)t + B6(GRW)t + B7(CPI)t-1 + B8(GDP)t-1$

MODEL.3: $NIIit = B0 + B1(NIM)t + B2(CRR)t + B3(ROA)t + B4(CAR)t + B5(ROE)t + B6(GRW)t + B7(CPI)t-1 + B8(GDP)t-1 + B9(PUB)t + B10(POST)t + B11(PPUB)t$

The non-interest income ratio, measured as the ratio of non-interest income to total income, is an indicator of the importance and focus that banks place on non-interest income. It tends to increase as interest margins decline. This ratio is often used in the literature to explain issues such as income diversification, bank risk, and bank performance. Our model includes studies such as Stiroh and Rumble (2006) that include non-interest income as a dependent variable. A high credit/asset ratio is an indication that the bank acts with more traditional motives and use many studies (Bailey-Tapper, 2010; Meyappan et al.,2019) to explain non-interest income. So, we can say that the bank deals with core banking activities and is focused on interest income. It is expected that large banks will increase their presence in the market and therefore focus on areas that generate more non-interest income. Therefore, as bank assets increase, the non-interest income rate will also increase. Assets owned by banks have been used in many studies (Damankah et al.,2014; Hahm,2008) to express non-interest income. We can expect banks with higher capital adequacy ratio to have higher non-interest income. In other words, the ratio of non-interest income to total income and the capital adequacy ratio are expected to move in same direction. In the literature, studies that use the equity ratio as an independent variable to explain non-interest income (Hahm, 2008; Köhler, 2019). A high inflation environment generally inhibits the growth of long-term capital markets such as bonds, mortgages and retirement income funds (Hahm, 2008). Also, a lot of studies use profitability measure to determine non intereset income (Pennathur et al., 2012). The study of the net interest margin is included, as are a number of other studies (Le, 2017; Williams & Rajagaru, 2012; Vithyea, 2014) on the view between the interest margin and non-interest income, as a period of declining non-interest income

may lead to higher interest income. Additionally, other studies in the literature that use inflation data to explain non-interest income include Atellu (2012) and Damankah et al. (2014). As in many other studies (Hahm, 2008; Meslier, 2014), GDP growth is used as a benchmark for the economic level of development.

Table 3. Variables Included in the Analysis

	Variable	Explanation	Notation
Dependent Variable	Non-Interest Income	Share of Non-Interest Income in Income	NII
Independent Variables	Net Interest Margin	Net Interest Income / Assets Share of Credits in Assets	NIM
	Credit Rate	Net Profit / Assets (Average of the Last Two Years)	CRR
	Asset Return Ratio	Net Profit / Equity Capital (Average of the Last Two Years) Equity	ROA
	Equity Profitability Ratio	Capital / (Capital Required for Credit + Market + Operational	ROE
	Capital Adequacy Ratio	Risks)	
	Asset Growth Rate	Annual Change of Assets Annual CPI	CAR
	Inflation	Annual Change of Gross Domestic Product	GRW
	GDP		CPI
			GDP
Control Variables	Public Banks Legislative	Public Bank Dummy Before the Regulations Regulations Made	PUB
	Change Effect of	by the CBRT in 2020 Dummy Effect of Legislative Change on	POST
	Legislative Change on	Public Banks	PPUB
	Public		
	Banks		

Average, minimum, maximum values and standard deviation etc. regarding the variables related to the model. Basic descriptive statistical data are presented in Table 4 below.

Table 4. Descriptive Statistics

	Observation	Average	Standard Deviation	Maximum	Minimum
NII	209	14	7	38	-4
NIM	209	3	1	6	-1
CRR	209	6	10	8	3
ROA	209	1	1	3	-2
ROE	209	10	7	25	-31
CAR	209	17	3	32	13
GRW	209	22	27	330	-18
CPI	190	11	4	20	6
GDP	190	5	3	11	1

On the basis of the bank data analyzed in the study, the average non-interest income as a percentage of total income for the selected banks is estimated to stand at 14 percent between 2011 and 2021. On the other hand, the maximum net interest margin of banks during this period was 6 percent, while the average was measured as 3 percent. When we look at the inflation data, the highest

inflation rate was calculated as 20 percent, while the average of this rate was 11 percent for the years in question. In selected years, the average annual change in GDP was 3 percent. Moreover, on average in selected years, the proportion of banks' credits to assets is 6 percent.

4.3. Results

The study used fixed-effects direct estimation to analyze the statistical relationship between the dependent and independent variables. In addition, in the second model, the impact of the legislative changes regarding fees, commissions and expenses that can be charged from both commercial customers and financial consumers, put into effect by the CBRT in 2020, on the non-interest income ratio of selected banks was added to the analysis. The main objective of the study is to identify the variables that are likely to be the key drivers of non-interest income, to determine whether there is a statistically meaningful correlation between these variables and the ratio of non-interest income, and, as a further step, to compare the effect of the above-mentioned legislative change on the ratio of non-interest income of selected banks with the public control variable. In the analysis, fixed effect linear estimation model was used (Correia, 2016). The analysis results obtained from the models are given in Table 5 below.

Table 5. Model Results

Variables	(1) NII	(2) NII	(3) NII
NIM	-2.801*** (0.498)	-5.661*** (0.557)	-4.101*** (0.507)
CRR	-0.305*** (0.069)	-0.194*** (0.070)	-0.257*** (0.049)
ROA	14.170*** (2.120)	12.340*** (2.039)	6.947*** (1.728)
CAR	-0.675*** (0.164)	-0.325** (0.161)	-0.263* (0.156)
ROE	-0.952*** (0.199)	-0.618*** (0.191)	-0.393* (0.201)
GRW	-0.002* (0.012)	-0.112*** (0.030)	-0.150*** (0.044)
CPI		-0.632*** (0.100)	-0.593*** (0.101)
GDP		0.271** (0.129)	0.305** (0.134)
PUB			-0.026*** (0.010)
POST			0.0223 (0.016)
PPUB			-0.072** (0.028)
Constant	0.449*** (0.064)	0.453*** (0.064)	0.483*** (0.050)
Bank Fixed Effect	Yes	Yes	Yes
Observation	209	190	190
R2	0.561	0.680	0.557

*** p<0.01, ** p<0.05 and * p<0.1 show statistical significances at the 1%, 5% and 10% levels, respectively. The numbers shown in parentheses under the coefficient estimates indicate robust standard error.

In the first model, it is understood that A strong negative relationship exists between non-interest income and net interest margin. In the model, the non-interest income ratio is negatively affected by the net interest margin, with a coefficient of – 5.661. Accordingly, the impact of the credit rate

on the non-interest income ratio is – 0.194, while the impact of the return on equity on the non-interest income ratio is – 0.618. In addition, the non-interest income ratio is affected by the growth rate of assets and inflation, as measured by – 0.112 and – 0.632, respectively. Additionally, the asset profitability ratio has a positive and significant impact on the non-interest income ratio. Impacts of these variables on the non-interest income ratio are respectively; 12.34, – 0.325 and 0.271. In addition, the R square value of the variables in the first model was measured as 0.68.

Looking at the impact of the fee, expense and commission regulations put into effect by the CBRT in 2020 at the third model, although the analysis indicates that the non-interest income ratio of the banks subject to analysis is not significantly affected by the legislative change alone, it is seen that the effect of the regulations that limit the fees charged by banks on the non-interest income ratio of public banks is at the level of-0.072. The ratio of the explanatory variables included in the third model to the dependent variable was measured to be 0.56.

5. Conclusion

The main purpose of banks' existence is to generate income and profit. Maximizing the profit to be obtained depends on increasing the revenues to the maximum extent. In order to ensure revenue growth and sustainability, banks need to consider many different criteria, constraints and variables together, and act in accordance with these parameters. The study revealed that bank-specific items including the net interest margin, credit ratio, asset profitability, equity return, capital adequacy ratio, asset growth rate and macro variables such as gross domestic product and inflation are the main drivers of banks' non-interest incomes. It is understood that the variables in question are compatible with the literature.

The regression analysis shows a clear negative correlation between the net interest margin and the non-interest income ratio. These findings are consistent with the literature. It was stated in their study that banks with low net interest margins tend to engage in more non-interest income generating activities in order to increase their income (Rogers & Sinkey, 1999). According to this; it is thought that in conditions where the net interest margin of banks narrows, they can compensate for this narrowing by generating more non-interest income and thus balance the possible decreases that may arise in their income. The analysis revealed a negative significant relationship between the credit ratio, i.e. the ratio of credits to bank assets, and the non-interest income ratio in both models. Accordingly, the result in question is compatible with the studies in the literature. In his research, Hahm (2008) found a negative relationship between the credit rate and the non-interest income ratio. In this respect, it is understood that as the share of loans in the assets of banks' balance sheets increases, they obtain more interest income instead of non-interest income, thus the share of non-interest income in total income decreases. When we look at the asset profitability ratio and equity profitability ratios in the models' subject to analysis, it is seen that different results are obtained in the literature between these variables and non-interest incomes. On the contrary, Tshweneyagae

(2016) and Hahm (2008) revealed a positive relationship between non-interest income and asset profitability in their studies. In this case, it is considered that banks with higher asset profitability can make the investments needed to increase their non-interest income relatively cheaper and thus achieve a high non-interest income rate. It is understood that banks with high return on equity have a higher proportion of interest income from traditional banking income in their total income than non-interest income. Therefore, having a strong equity capital structure is critical for these banks to minimize potential risks. Maintaining high capital adequacy ratios are one way to achieve this. The models revealed a negative and significant relationship between the capital adequacy ratio and the ratio of non-interest income to total income. Accordingly, it is evaluated that if banks have a strong capital structure that minimizes risk, they will direct their activities to traditional income methods and thus the proportion of interest income in total income will be relatively greater than that of their non-interest income. On the basis of the model results, it is evaluated that as banks grow their assets compared to previous periods, they direct the income from growing assets to their main activities, thus they may have the opportunity to earn more interest income compared to non-interest income.

Finally, the study's suggestions can be categorized into two headings. The first heading is recommendations for policy makers. Policy makers can predict the changes that will occur in bank revenues as a result of the decisions they make and support non-interest income generating services to reduce banking revenues in periods of contraction. Thus, the role of banks in ensuring financial stability will be facilitated by the income balancing opportunities provided to them. Secondly, banks can also diversify their income by increasing their equity capital and collecting more resources. Banks with a strong capital structure can reduce their risks and prevent possible fluctuations in their income. Since banks' focus only on non-interest income is a disturbing issue for customers, it should not be ignored that there is a risk of losing customers.

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