The Impact of Turkish Monetary Policy on North Cyprus Banking Sector

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ABSTRACT

Turkish Lira is the legal tender in the Turkish Republic of Northern Cyprus. This makes the Turkish Republic of Northern Cyprus be in the Turkish lira zone. The monetary policy decisions of Turkey's central bank, to a great extent, determines the monetary policy in the Turkish Republic of Northern Cyprus. Even though the Turkish Republic of Northern Cyprus has its own central bank, the impact on the policy change is very minimal and so the monetary policy in the Turkish Republic of Northern Cyprus has to be in parallel with Turkey's central bank. This thesis aims to investigate the impact of the monetary policy changes and the instability in Turkey on the banking sector of the Turkish Republic of Northern Cyprus. This panel data study will cover the period of 2004-2019. The findings show that interest rates have a significant and positive impact on return on equity and return on the asset on banks, implying that an increase in interest rates improves the financial performance of financial intermediaries in the Turkish Republic of Northern Cyprus. An increase in total loans to total deposits has also been found to have a positive and significant impact on return on equity and return on assets. Inflation, on the other hand, has a negative impact on the return on equity. Changes in exchange rates are estimated to have no significant effect on the bank's return on equity and return on asset in the Turkish Republic of Northern Cyprus. However, this is not the case for non-performing loans where this study finds that fluctuations in exchange rates worsen the asset quality of the banking sector. As expected, instability in Turkey proxied by the instability index also has a deteriorating significant impact on the non-performing loans. An increase in total deposits and the ratio of total loans to total deposits both have a significant and positive impact on total loans. This study also finds that an

increase in interest rates leads to a decrease in total loans. Finally, gross national product growth which has been used as a control variable in the model has been found to have a positive association with the size of banks in the Turkish Republic of Northern Cyprus. Exchange rates, total loans to total deposits, and total deposits were also found to have a positive impact on the size of the sector. However, interest rates indicate a negative impact on the total asset size of the banking sector in the Turkish Republic of Northern Cyprus. The findings of this study highlight the need for policymakers to keep a close eye on Turkey's monetary policy due to its high involvement in the Turkish Republic of Northern Cyprus banking activities. In addition, policymakers should also try to develop measures for mitigating the negative impact of inflation and instability that originates from Turkey.

Keywords: Monetary Policy Indicators, Instability, Bank Specific Variables, TRNC’s Banks.

ÖZ

Türk Lirası, Kuzey Kıbrıs Türk Cumhuriyeti'nde yasal paradır. Bu da Kuzey Kıbrıs Türk Cumhuriyeti'ni Türk Lirası bölgesinde olması anlamına gelmektedir. Türkiye merkez bankası para politikası kararları, büyük ölçüde Kuzey Kıbrıs Türk Cumhuriyeti'ndeki para politikasını belirlemektedir. Kuzey Kıbrıs Türk Cumhuriyeti'nin kendi merkez bankası olmasına rağmen, politika değişikliği üzerindeki etkisi çok azdır ve bu nedenle Kuzey Kıbrıs Türk Cumhuriyeti'ndeki para politikasının Türkiye merkez bankası ile paralel olması gerekmektedir. Bu tezin amacı, Türkiye'deki para politikası değişikliklerinin ve istikrarsızlığın Kuzey Kıbrıs Türk Cumhuriyeti bankacılık sektörü üzerindeki etkisini araştırmaktır. Bu çalışmada 2004-2019 dönemini kapsayacak şekilde panel veri kullanılmıştır. Bulgular, faiz oranlarının bankalar özkaynak karlılığı ve varlık getirisi üzerinde istatistiksel olarak anlamlı ve olumlu bir etkiye sahip olduğunu göstermektedir. Buda faiz oranlarındaki artışın Kuzey Kıbrıs Türk Cumhuriyeti'ndeki bankaların finansal performansını iyileştirdiği anlamına gelmektedir. Toplam kredilerin toplam mevduata oranının artmasının da özkaynak karlılığı ve varlık getirisi üzerinde olumlu ve anlamlı bir etkisi olduğu tespit edilmiştir. Diğer taraftan enflasyon ise özkaynak karlılığını olumsuz etkiliyor. Kuzey Kıbrıs Türk Cumhuriyeti'ndeki bankaların özkaynak karlılığı ve varlık getirisi üzerinde döviz kuru değişiminin önemli bir etkisinin olmadığı ortaya çıkmıştır. Ancak, bu durumun tahsili gecikmiş alacaklar hesaplarında farklı olduğu, çalışmanın döviz kurlarındaki dalgalanmaların bankacılık sektörünün aktif kalitesini kötüleştirdiğini ortaya çıkarmıştır. Beklendiği gibi, istikrarsızlık endeksinin temsil ettiği Türkiye'deki istikrarsızlık da sorunlu krediler ve tahsili gecikmiş alacaklıları artırmaktadır. Toplam mevduattaki artış ve toplam

kredilerin toplam mevduata oranı, toplam krediler üzerinde hem önemli hem de olumlu bir etkiye sahiptir. Bu çalışma aynı zamanda faiz oranlarındaki artışın toplam kredilerde azalmaya yol açtığını da ortaya koymaktadır. Son olarak, modelde kontrol değişkeni olarak kullanılan Gayri Safi Yurtiçi Hasıladaki büyüme ile Kuzey Kıbrıs Türk Cumhuriyeti'ndeki bankaların aktif büyüklüğü arasında pozitif bir ilişki bulunmuştur. Döviz kurları, toplam kredilerin toplam mevduata ve toplam mevduata oranı da sektörün aktif büyüklüğünü olumlu yönde etkilediği tespit edilmiştir. Ancak faiz oranları, Kuzey Kıbrıs Türk Cumhuriyeti'nde bankacılık sektörünün toplam aktif büyüklüğü üzerinde olumsuz bir etkiye işaret etmektedir. Bu çalışmanın bulguları, Kuzey Kıbrıs Türk Cumhuriyeti bankacılık sektöründe faaliyet gösterenlerin Türkiye merkez bankası para politikalarını yakından takip etmeleri gerektiğini vurgulamaktadır. Ayrıca politika üreticileri, Türkiye kaynaklı enflasyon ve istikrarsızlığın olumsuz etkilerini azaltmak için tedbirler geliştirmeye çalışmalıdır.

Anahtar Kelimeler: Para Politikası Göstergeleri, İstikrarsızlık, Bankaya Özel Değişkenler, KKTC Bankaları

DEDICATION

I dedicate this work to my next-door neighbor, aunt Süheyla, the heroine of my childhood, who raised me as her child and to whom I owe my life.

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LIST OF ABBREVIATIONS

ADF	Augmented Dicker-Fuller
CB	Central Bank
CPI	Consumer Price Index
DWH	Durbin–Wu–Hausman
EXC	Exchange Rate
GLS	Generalized Least Square
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GNP	Gross National Product
INF	Inflation Rate
INS	Instability Index
INT	Interest Rate
IRF	Impulse Response Function
LODEP	Loans to Deposits Ratio
NIM	Net Interest Margin
NPL	Non-Performing Loan
OLS	Ordinary Least-Square
ROA	Return on Asset
ROE	Return on Equity
TOTAS	Total Assets
TOTDEP	Total Deposits
TOTLOA	Total Loans
TRNC	Turkish Republic of Northern Cyprus
TL	Turkish Lira

UK	United Kingdom
VAR	Vector Auto-regression
WPI	Wholesale Price Index

Chapter 1

INTRODUCTION

1.1 Background of the Study

In recent years, several issues have been of concern in the banking sector, such as profitability and efficiency. This is as a result of the important roles it plays in a nations' economy. Sulaiman (2016) indicates that a stable and secure financial sector is one of the most critical determinants of a country's economic stability and efficiency. Hence, the banking sector is one of the vital indicators of a country's financial system. Some of the roles played by banks are managing client bank accounts, overseeing transactions, and accepting deposits with interest, and transferring these funds to individuals and businesses with profit-bearing loans. This provides liquidity in an economy.

There are many factors that contribute to bank profitability and efficiency. They are bank indicators and macroeconomic indicators. Bank-specific indicators include bank size, credit risk, profitability, efficiency, operating leverage, and liquidity ratio. While the macroeconomic indicators consist of government policies fiscal and central bank (monetary) policies. The monetary policy, which ensures a stable financial system and is under the authority of the Central Bank (CB) on behalf of its government, will be the primary concern of this study. Banks in all the economies are under the regulations and supervision of central banks and authorities responsible for the stated competencies. At first glance, the CB appears to be a bank of all banks,

where the activities of banks are being monitored. Even though a safe deposit box is one of CB's important primary duties, it still has more key functions to perform in today's market. Among them are achieving price stability or fighting against inflation, printing money, regulating the government's borrowing resources, intermediating banks, protecting the value of the national currency, managing gold and foreign exchange reserves, money circulation regulation, regulating the exchange rate regime and many others are important tasks of Central Bank. Central Banks can use many tools to perform these duties. Monetary policy is a tool used to control foreign currency volume with the help of various instruments, such as open market operations. In addition, central banks use cash reserve ratio and discount rate, moral persuasion, direct monitoring of the bank loan, and sincere control of the lending and borrowing interest rate (Loayza &Schmidt-hebbel, 2002).

Basically, it aims to keep the price movement under control by reducing and raising the money supply in the market and regulating interest rates. The structure, policies, and tools of the institution in the literature are a matter of science in itself. Because in free-market economies, its intervention is the biggest authority that produces tangible results and is an indispensable observer of every economy. The task of monetary policy is to control money and credit to achieve the goals of output growth and financial stability in the economy. Traditional monetary policy theories focused mainly on the money supply and, consequently, changes in the economy that changed the rate of interest and spending level (Fiedman & Schwartz, 1963; King & Plosser, 1984; Sim, 1992).

Monetary policy refers to the combination of measures designed to stabilize the value, supply, and cost of money in an economy with the level of economic activity.

It's defined as the ability to control the direction and movement of money and credit opportunities for stable prices and economic growth in the economy (CBN, 1992).

Monetary policy contributes significantly to sustainable economic development by increasing the performance of banks. In other words, monetary policy is actions that undertake to affect the cost of money and credit and their availability (Zaman et al, 2014).

There is a consensus among economists and policymakers that monetary policy mainly operates on the interest rates mechanism. When the central bank principle is tightened by reducing the reserve, it results in interest rates rise. The increase in interest rates causes a decrease in the expenditures of the interest sections of the economy, such as purchases of housing and consumption goods. Banks play a role in this mechanism as it is one of the main factors that increase the interest rates in the interest supply, which consists of deposit books (Amidu, 2006).

Compliance with the regulatory and supervisory laws and regulations is prerequisite and important for achieving a stable and well-functioning banking sector. In some countries, like Turkey and UK, the supervision and regulation competencies are separated from the monetary policy and are delegated to other public agencies or commissions. Depending on their mandate, central banks set their monetary policies with the objectives of reaching and achieving some goals, such as price stability, economic growth, and unemployment rate reduction. Hence, these policies directly affect member banks' total loans, total deposits, and non-performing loans (NPL).

In today's globalized world, the decision of a central bank in one country affects the economy of the other countries. Changes in interest rates, in particular, mean the exchange of hot money, causing the investor to move from one country to another, causing the exchange rate to rising and the local currency to become devalued. Banking and currency crises have gone together lately. Thailand, Indonesia, Argentina, Turkey, and other countries have experienced exchange rate shocks that became more virulent as they eroded bank capital and decreased bank lending. As a result, difficulties in the banking sector reduced investor confidence and accelerated capital flight. The decline in brokerage houses forced firms to cut spending and production by removing the credit lifelines of firms amid the crisis (Sengonul and Thorbecke, 2005).

Central bank decisions play a vital role in the financial conditions of investors and foreign countries by directly affecting the important economic indicators of the country. This is common with an economy that is dependent, dollarized, or a member of a currency union. When a country gives up the option to print its own money, it loses its ability to directly influence its economy, including its right to administer monetary policy and any form of exchange rate regime. Kosovo and Liechtenstein are internationally recognized countries that do not have their currency. They use other countries' currencies, thereby leading them to be dependent on foreign countries and reducing their influence over their economy and banking sectors. Following the unilateral adoption of the euro in Kosovo, a central bank faces further restrictions to fulfill its lending functions. However, in the context of a unilateral adaptation of the euro, a Central bank may be considered to provide liquidity to commercial banks, but not mainly due to the difficulty of such a central bank to lend

more than its own funds. We all understand that in the fragile environment where we work, the failure of an institution can spread rapidly and threaten the solvency of the whole, otherwise sound banking system (Svetchine, 2005).

1.2 The TRNC Banking System

The banking sector, which is the cornerstone of the financial institution of the TRNC economy, started with the existence of the first-capital bank called Limassol Turkish Cooperative Bank Ltd in 1939. Later, the establishment of the first branch bank of Türkiye İş Bankası A.Ş. was in 1955 and a public bank Kıbrıs Vakıflar Bankası Ltd in 1982. Furthermore, the activities of these banks commence fully in the year 1983. As the activities increased, so as the number of banks operating in TRNC increased, with a current total of 21 banks, where fifteen (15) are private capital, five (5) branches, and one (1) public bank (Kalmaz and Tamel, 2017). Although TRNC banks have developed due to the 1980s liberalization trend, it has failed to go through the same evolution as banks of its age to construct a sound and dependable system. This is due to its deficiencies to prevent the occurrences of financial crises in its economy, and hence it has become vulnerable (Safakli, 2011). Banks operating in the TRNC are under the proper supervision of the Central Bank. This is to detect and prevent the breaking of banking rules and regulations, customers' protection, and monitoring the financial activities done in the banking system. Also, to prevent the existing proliferation of banks and the insufficiency of the Ministry of Finance in TRNC.

The TRNC banks faced tougher competition from the Turkish bank branches due to them operating in small markets with limited funds. Banks overstretched themselves and subjected their portfolios to high risks to get a larger piece of the available pie,

leaving them with little to fall back on in the case of a banking crisis (Safakli & Altuner, 2009).

Northern Cyprus's economy has a history of banking crises and boom-bust cycles. The exchange rate crisis in Turkey caused the economy to contract, which hampered the development of the Northern Cyprus Banking Sector. The crisis sapped much-needed funds from the economy, resulting in additional hardships and weakened markets in the TRNC. Another factor that contributed to the banking crisis in 2000 was the TRNC Central Bank's lack of banking supervision. Banks were required to operate in a highly politicized climate before the banking crisis. Political clout was utilized to obtain loans and finance for businesses and, as a result, other industrial projects that would not have been authorized on their own merits. This political interference in the banking sector harmed banks' liquidity positions and resulted in bad debts and non-performing loans.

There was a totally insufficient regulation and supervision of the banking sector of Northern Cyprus by the TRNC central bank. Prior to 2000, the TRNC Central Bank made infrequent on-site inspections of the banks, the rise in the number of licensed banks was not matched by a rise in personnel working in the banking supervision department. The on-site inspections were conducted at a rate of once every three years during the 1990s. The inspection reports addressing the risks and weaknesses of the banking sector are sent to the Ministry of Finance for further action, but unfortunately, these were ignored by the politicians. Inspections and audits are conducted regularly from the comfort of top offices, without ever examining detailed records. The regulatory bodies' lax approach has had a substantial impact on TRNC banking failures.

The inadequacy of the regulation and supervision resulted in extremely low entry barriers into the banking market. This trend has resulted in a very low license value in banking, which has significantly increased the overall risk level in the banking sector, transforming them into a central institution of profit maximization without regard for risks in the banking sector. As shown, all those firms who owned banking entities and took excessive risks failed along with their connected banks. As a result of this and other “unethical banking” practices, bankers and employees of those holding companies lost their jobs. Many people who deposited their funds into those banks lost their deposits and didn't recover their funds as a result of depositors' funds not being covered by deposit insurance schemes.

According to the Journal of Yasar University by Şafakli and Altuner, (2009), bank management was very complicated before the banking crisis due to macroeconomic instability. As characterized by the high volatility in real interest rates, chronic inflation, persistent fiscal imbalances, and balance of payments crises, the macroeconomic instability resulted in substantial credit and foreign exchange risks along with relatively short planning horizons in Turkey and Northern Cyprus. The Turkish Lira depreciated, and inflation surged to 70% in 2002 as a result of macroeconomic instability and successive financial crises in Turkey in the 1990s and 2001, which got the TRNC economy affected. Treasury bill rates shot up to around 200% in early 2001 and, real interest rates (ex-post) rose to about 30%. Since then, economic conditions in Turkey have improved markedly, inflation has fallen, and growth has bounced back, though real interest rates have remained elevated at around 10% (see detailed discussions on IMF 1998 and 2000; TBB, 2005). One of the most notable features of the 1990s was the extremely high interest rates on the Turkish

Lira, which is used as legal tender in North Cyprus, which had a considerable influence on TRNC banking institutions.

The banking sector in the TRNC was financing the Republic of Turkey's Treasury and extending almost no credits in the domestic credit market. Turkish Treasury being the largest credit customer of the local banks, crowded out the local credit customers in the TRNC. The TRNC consumer price inflation in Northern Cyprus generally follows that of Turkey. Turkey has had persistently high inflation for the past thirty years, with CPI reaching three digits in 1980 and 1994, and for much of that time exceeding the 45 percent average for the year 2002.

The TRNC central bank performs a lot of functions in regulating the banks in TRNC but made use of the Turkish lira instead of producing a national currency. Even though issuing the national currency has been in discussion since the early '90s, no action has been taken. In TRNC, the monetary authority is with the central bank. However, TRNC's central bank has no monetary policy, including changing the money supply or setting interest rates independently. In other words, TRNC central bank only uses fiscal policy. This is base on the fact that the country is a *de facto* currency union with Turkey. In other words, the Turkish Republic of North Cyprus (TRNC) is in the Turkish lira zone. The legal tender in TRNC is Turkish Lira (TL). This implies that the monetary policy determined by the Turkish Republic Central Bank has a direct impact on the economy and banking sector of TRNC. Because the Turkish Lira was the legal tender during dollarization, the TRNC's inflation and monetary policy had no relationship. This makes the inflation occurring within Turkey the basis originator of inflation for TRNC.

Turkey is the only country that recognizes the sovereignty of TRNC and has established close political and economic ties with it. Economic isolation from the global economy has abolished the capability of the Turkish Cypriot economy to generate foreign currency resources, which are unavoidably necessary for the sustainable development of a small island economy. This leaves the North Cyprus economy excessively dependent on Turkey, and foreign currency inflows in the form of aid and export earnings obtained both from and via Turkey (Günçavdi, & Küçükç, 2009).

As of 1999, the TRNC economy faced a crisis that affected the banking sector, which triggered the formation of a framework called the Economic Stability Program to address the problem. It was put in place to restructure the central bank by amending the existing bank laws to prevent the recurrence of the crisis and ensuring one-stop and more effective supervision of the banking sector in TRNC. This was established in the year 2000. Since then, banks have continued their operation, and the central bank of TRNC watch out to prevent the recurrence of the crisis. With the contribution of the State Planning Organization, the alternative to the central bank at the technocrat level, the government determines development plans and annual programs for the economic targets in TRNC. Especially the "Program for 2008" specifies %5 of real growth rate, and %5 of inflation has been targeted (SPO, 2007). Both the real and sectored plans are based upon the growth rate. Even though finance and budget policies are not included within the economic programs, monetary policies are not also included within the economic targets and this fact is reflected within the annual reports. Because the TRNC Central Bank acts as "Banking

Regulation and Inspection Institute" rather than nourishing monetary policy with respect to the economic targets (TRNC Central Bank, 2006).

As of 2020, a new banking law was placed to govern the norms regarding the establishment and maintenance of confidence and stability in financial markets, the protection of the rights and interests of depositors, and the efficient operation of the financial intermediation system (TRNC Central Bank, 2020). The Banks operating in the Turkish Republic of Northern Cyprus are within the scope of this Law. The provisions of this Law apply to banks created under special laws, without regard to the provisions of such laws. The Central Bank uses the powers given to it under this Law, and other laws related to this Law, by establishing regulatory procedures, or by taking special decisions.

1.3 Aim of the Study

Turkish Lira (TL) is the legal tender in the Turkish Republic of Northern Cyprus (TRNC). This makes TRNC be in a TL zone. The decisions of Turkey's central bank monetary policy, to a great extent, determines the monetary policy in TRNC. This thesis aims to investigate the impact of Turkish monetary policy changes on the banking sector of TRNC. In this respect, the association between interest rate changes and other monetary policy indicators toward total assets, total deposits, total loans, and nonperforming loans of the TRNC's banking sector would be addressed.

1.4 Data and Methodology

In this research ordinary least square (OLS) regression method has been employed to investigate the relationship of Turkish monetary policy on the TRNC banking sector. Return on equity, Non-performing loans (NPL), Total assets, total loans, and total deposits are the bank-specific variables. While GDP growth, changes in the value of

the Turkish lira against foreign currencies, and inflation are macroeconomic variables. The study used panel data from 2004 to 2019 period.

1.5 Hypothesis of the Study

For the objectives of this study, a number of hypotheses are drawn to aid the conclusion of the study. Below are the hypotheses:

H1 = Turkish monetary policy has no impact on the return on equity of TRNC banks.

H2 = Turkish monetary policy has no impact on the return on assets of TRNC banks.

H3 = Turkish monetary policy has no impact on the total assets of TRNC banks.

H4 = Turkish monetary policy has no impact on the NPL of TRNC banks.

H5 = Turkish monetary policy has no impact on the total loans of TRNC banks.

H6 = Turkish monetary policy has no impact on the total deposit of TRNC banks.

1.6 Study Structure

This study is structured into five (5) sections, consisting of the introduction as the first chapter, which comprises the study background, objectives, and the study methodology. The second chapter considers the literature review of the research topic. The third chapter is the methodology, and afterward data analysis. Estimation and analytical results are presented in the fourth chapter. Lastly, the conclusion and policy implication of the research will be presented.

Chapter 2

LITERATURE REVIEW

In this chapter, a literature review will be done about how macroeconomic indicators affect the banking sector. In this respect, first, banking will be defined shortly, then macroeconomic policies mainly monetary policy, and then empirical work related to the topic will be reviewed.

When we examine the works of literature about the impact of monetary policy on banks' performance, we observed that there are many studies that investigated this issue. However, there are few on the monetary policy and TRNC banks. In general, studies found results that are a mix, where the majority found the existence of a relationship between the monetary policy and the banking sector to be either direct or indirect and a few did not.

2.1 Banking System

The banking sector is a corporation and a segment of the financial system devoted to holding financial assets (deposit) for its client and investing those financial assets in a leveraged way (loans and securities) to create more wealth. Banks fulfill several key functions in the economy, such as a collection of the deposit, issuance of loans, and insurance of financial assets on behalf of their customers. Allen and Gale (2000) suggest that banks improved the allocation of scarce capital by extending credit to where it is most productive, also saving and borrowing allow consumers to plan their consumption over time.

Banks help savers manage their liquidity risk and enable long-term investment of illiquid assets with liquid liabilities in the economy (Diamond and Dybvig 1983). Beck et al (2020) stated a theory pointing out liquidity creation as a vital mechanism through which a developed banking system helps economies grow faster. They also added that the role of banks in the new 'knowledge economy' is gradually decreasing compared to other types of financial intermediaries and markets that perform similar duties and more. In addition, it can also be the reliance on intangible assets by the advanced countries to increase their economic growth.

2.2 Monetary Policy

Among the main macroeconomic policies, there exist fiscal and monetary policies. In the context of this thesis, there will be a concentration only on the monetary policy. The monetary policy involves the act of money supply and regulating the circulation of money in an economy (Segal, 2021). This policy is designed and implemented by the central bank of a country, on behalf of its government. Monetary policy is put in place for the achievement of certain macroeconomic goals, such as price stability, growth in GDP, exchange rate stability, the balance of payment, and lowering inflation, etc. As a result of a shared interest known as money, these variables tend to have a large impact on the banking operations in any given economy. Monetary policy takes two approaches, either the expansionary or contractionary approach of monetary policy.

Expansionary monetary policy is implemented where the central bank wishes to increase the money supply in circulation and lower the interest rate, thereby boosting the aggregate demand in the economy (Amadeo, 2020). This is done to stimulate economic growth by fighting issues of deflation, unemployment, and recession in an

economy. Cai (2021) supported the statement above by stating that investment increased more for more productive firms in the incident of expansionary approach. However, after controlling for confounding factors, it led to the misappropriation of bank loans to less productive firms.

The opposite of the expansionary monetary policy is contractionary monetary policy, which plays the role of reducing the supply of money in circulation in an economy, and it is used to resolve issues of inflation. This approach reduces banks' available resources, which consequently lowers their ability to make profits (Akomolafe, et al, 2015). A contractionary monetary policy shock has a long-term negative impact on commercial bank asset growth, but it boosts shadow bank asset growth and securitization activity. Nelson, Pinter, & Theodoridis (2015) further, explain that monetary policy can usefully get in all the crevices of the financial sector uniformly. These monetary policy approaches are used, depending on the economic situation at the point in time, to suit the economy.

Monetary policy has also an indirect impact on the banking sector via current account and financial account of the balance of payment because of change in the exchange rates which is directly related to interest rates especially in floating exchange rate regime countries.

2.3 Empirical Review

As mentioned in the previous chapter on the elements that affect the bank's performance, financial ratios are often employed to evaluate its profitability and efficiency. This allows banks to keep a long-term eye on their operations and spot problems before or after they occur.

In the incident of bank efficiency, Andries and Cocris (2010) analyzed the efficiency of the biggest banks in three European countries, namely Romania, Hungary, and the Czech Republic, between 2000 and 2006. They used a frontier analysis and found the banks reaching low levels of cost efficiency and technical efficiency with the influence of micro and macroeconomic indicators. The macroeconomic indicators also resulted in a similar result in Turkey. A study by Kakilii Acaravci and Calim (2013) explored its association with Turkish commercial bank profitability and discovered a sensitive reaction of banks to overall economic development. Furthermore, Niţoi (2009) found a contrary result in the case of Romanian banks, which indicates a low level of efficiency in the majority of Romanian commercial banks.

Bashir (2003) examine the determinant of Islamic banks' profitability and found a significant relationship existed. The same study finds that banks' profitability is boosted by the increase in loan-to-asset and capital-to-asset ratios. In addition, there is a positive linkage between GDP and the success of Islamic banks. In another study on Islamic banks, Noor and Ahmad (2011) examined 78 Islamic banks from 25 countries from 1992–2009. They discovered that higher operating expenses to assets ratios, more equity to assets ratios, and high income all have a favorable and substantial impact on Islamic banks' financial performance. The study by Rafay and Farid (2019) demonstrates the significant role played by Islamic banks in channeling monetary policy decisions to the real economy in Pakistan. They imply that Pakistani policymakers should recognize Islamic banks' functional role in the development, execution, and evaluation of monetary policy. Another study by Kumar, Acharya, & Ho (2020) investigates the relationship between monetary policy and 19 banks'

profitability in New Zealand with a generalized method of moments (GMM) estimator from 2006 to 2018. The figure out that an increase in short-term interest rates leads to a rise in banks profitability, while an increase in long-term reduces banks profitability. Aside from monetary policy variables, the capital adequacy ratio had a favorable impact on banks' profitability, but the non-performing loan ratio and cost to income ratio had a negative influence on banks' profitability.

Kunt and Detragiache (1998) examined the determinant of banking crises in developed and developing countries using a multivariate logic model. They found that banking crises are caused by a weak macroeconomic environment, claiming that low GDP and rise in inflation triggered the increase of banking sector risk. Similarly, Abduh, Omar, & Duasa (2011) found that inflation hurts the total deposits of Islamic banks in the event of a recession. The Islamic banks in developing countries were being investigated on how they react to macroeconomic indicators during the financial crisis period from 2007 to 2010. Using the generalized least square (GLS) method, Mohammed and Muhammed (2017) found that the macroeconomic indicators such as inflation rate, gross domestic product growth, and gross domestic product have a positive significant relationship with the return on assets of Islamic banks. Moreover, when evaluated with the financial crisis dummy, the financial crisis influenced bank performance by the decrease in profitability of Islamic banks in emerging countries.

Tan and Floros (2012) considered China banks' profitability and state that higher cost-efficiency, higher banking sector, lesser volume of nontraditional activity, and stock market development lead to an increase in the profitability of Chinese banks. As for net interest margin (NIM), they figured out that the effect of NIM goes by

bank size. Where, smaller bank size appears to have a better NIM compared to the bigger banks in China, and also, higher NIM can be explained by the higher liquidity of Chinese banks. Athanasoglou, Brissimis & Delis (2008) stated that all bank-specific determinants affect the profitability of banks in Greece except for bank size. Asma, Fadi, and Noor (2011) found the contrary finding, where only bank size has a positive impact on the profitability of Malaysian Islamic banks. Other variables, such as capital adequacy, total assets, liquidity, and management of expenses credit risk, have no bearing on Islamic banks' profitability.

In considering monetary policy and banks, Gertler and Gilchrist (1993) conducted a study to see how bank business loans react to policy tightening. Their research shows that when policies get tightened, business loans do not decline. In conclusion, they discovered that a decline in consumer and real estate loans was the cause of the overall decline in total loans. Furthermore, a narrow analysis of lending to manufacturing companies reveals that bank lending grew dramatically as a result of the tighter policy. Indeed, it appears that the majority of increased manufacturing loans are going to larger companies, as banks restrict lending to small businesses in the event of a tightened policy. Similarly, Kashyap and Stein (1995) employed the OLS analysis to measure how total deposits, total loans, and securities react to monetary policy shocks. They claim that the tightened policy led to a decrease in core deposits for banks of the size. Curiously, large banks' loan volume appears to have increased significantly in the short run in reaction to a monetary contraction, similar to total loans. These appear to be due to large banks' differential behavior compared to smaller banks.

Akıncı, Matousek, Radić, & Stewart (2013) researched 25 commercial banks' operation and monetary policy in Tukey using pooled OLS estimation. They found a two-direction relationship existing between loan growth and monetary policy, either directly through the interest rate or indirectly through the bank lending channel. Similarly, in the case of capital and economic growth, a positive reaction to the banks' loan increase, in the long run, is seen. On the other hand, inflation and bank size do not have a significant relationship with loan growth. In addition, from 1987 to 1991, Molyneux and Seth (1998) discovered that capital strength, commercial and industrial loan growth, and asset composition were all critical determinants in influencing foreign banks' return on assets. Suggesting that capital strength is the most important element impacting the return on shareholders' equity of foreign banks.

Osakwe, Agbo, and Okonkwo (2019) examined the effect of monetary policy instruments on banking sector credits in Nigeria. They employed monetary policy rate, Treasury bill rate, cash reserve ratio, and liquidity ratio as the monetary policy tools. In addition, the Augmented Dicker-Fuller (ADF) unit roots test, Johansson co-integration test, Vector Error Correction Model, and Impulse Response Function (IRF) were used to conduct the research. The findings revealed that monetary policy tools and bank credit have a long-run relationship in Nigeria, with the monetary policy rate and liquidity ratio having long-run positive effects and the Treasury bill rate and cash reserve ratio having long-run negative effects on bank credit. Even though Sweden's monetary policy rate is negative, Madaschi & Pablos (2017) found that bank profitability continues to improve.

The adjustment of bank loans occurs in stages: initially, in reaction to policy tightening, bank transaction deposits or core deposits decline quickly, followed by total bank loans, but only after a two- to three-quarters delay. Banks can then continue to lend despite a drop in core deposits by issuing managed debt and selling securities, such as bonds and debentures. Finally, the final fall in bank lending corresponds to a drop in economic activity measured by industrial production. Changes in monetary policy, according to the bank lending channel, affect banks' loan supply plans. As a result, the central bank squeezes liquidity out of the system, forcing banks to convert reserves funds to unreserved funds to meet the economy's demand (Matousek and Sarantis, 2009). The non-performing loans ratio tends to have more effect than the capital adequacy ratio on the profitability of commercial banks measured by return on equity (ROE) in four Swedish commercial banks (Hosna, Manzura, and Juanjuan, 2009). Adeusi, Akeke, Adebisi, and Oladunjoye (2013) found that risk management indicators affect Nigerian banks' performance. Ajayi and Atanda (2012) researched from 1980 to 2008 on Nigerian banks' success towards the impact of monetary policies to determine long-term membership existence. Using the two-stage joint integration approaches of Engle-granger, interest rate, inflation rate, and bank interest indicate a boost in the bank loans in Nigeria. Liquidity and cash reserve ratios, on the other hand, demonstrate a pessimistic reaction to bank loans.

Khan and Sattar (2014) looked at how interest rate fluctuations affected the profitability of four large commercial banks in Pakistan from 2008 to 2012. They found a strong and positive correlation between commercial banks’ profitability and interest rate changes using the Pearson correlation method. It means that an increase

in interest rate changes would increase banks' profitability, due to the hike in banks' lending efficiency. Udeh (2015) explored the impact of monetary policy tools on single commercial bank profitability in Nigerian, called Zenith bank, and found a different result on the interest rate and bank's profitability. Where interest rate, cash reserve ratio, and liquidity ratio had no substantial impact on Zenith Bank Plc's profit before tax. The minimal rediscount rate, on the other hand, had a considerable impact on the bank's profit before tax. In conclusion, the research indicated that a good number of monetary policy tools have no impact on the profitability of commercial banks in Nigeria. Furthermore, suggest that commercial banks should search for ways to boost profitability other than monetary policy instruments.

Den Haan, Summer, and Yamashiro (2007) found that following a monetary tightening, commercial and industrial (C&I) loans increased, real estate and consumer loans decreased, with the authors interpreting this as reallocation to shorter-term, less risky assets. Similarly, low short-term interest rates soften bank lending standards and increase bank exposure. Ortiz-Molina and Penas (2008) found monetary contractions increase borrower risk and agency costs. Huang and Yu (2015) employ VAR models to investigate bank loans and monetary transmission in Taiwan, using a set of key macroeconomic variables and bank loan components. They figured business loans and secured loans increased as a result of monetary tightening, whereas consumer loans and unsecured loans decreased. They also found that during a real aggregate demand downturn, bank loans tend to be generally absent. Furthermore, loan portfolio decisions have influenced the observed changes in loan components following monetary tightening, suggesting the role of a "credit channel" in Taiwan's monetary transmission.

2.4 Summary of the findings of the literature review

From the various works of literature reviewed above, it can be concluded that monetary policy has a strong relationship with the banking sector in an economy. This policy helps to enhance the performance of the banking system of the various economy. Empirical work has shown that in general interest and economic growth has a positive impact on the banking sector in the various economies. However, inflation imposes a negative influence on the banking system. The combination of GDP growth and low inflation tends to reduce bank's risk in an economy.

In the incidence of tightened monetary policy, larger banks' loan volume increases significantly in the short run compared to the long run. Bank deposits, on the other hand, rise as a result of the high-interest rates placed on savings accounts. Also, higher cost-efficiency, lesser volume of nontraditional activity, and stock market development increase the profitability of banks.

Furthermore, the various bank’s specific indicators show a significant relationship with the measures of bank’s performance. Bank size, total assets, and total equity contribute to banks' performance growth, while the non-performing loan ratio declines its performance. Moreover, financial ratios showcase a positive effect on banks by boosting banks’ profitability and performance. These are the likes of higher operating expenses to assets ratios, loan-to-asset, capital-to-asset ratios, equity to assets ratios, and capital adequacy ratio. In terms of net interest margin, smaller size banks tend to have higher net interest margins than larger banks.

Chapter 3

DATA AND METHODOLOGY

3.1 Data Type and Source

In this part, data and its sources are presented. In addition, an overview of the methodology employed is explained.

3.1.1 Data Type

This research made use of secondary data. The choice of data is secondary as the study is based mainly on content analysis. This also avoids information bias. Moreover, a wide variety of literature was covered relating to bank performance and monetary policy. In this regard, Ghauri and Gronhaug (2005) suggested that all good research work should start with secondary data because it enriches the research with good information. This research work covered panel data from 2004 to 2019. The panel data covered 18 banks operating in the Turkish Republic of Northern Cyprus (TRNC) with a mixture of private, public, and branch banks. The banks are listed below:

Table 3.1: Banks Names

1	Kıbrıs Vakıflar Bankası LTD	Public Bank
2	Kooperatif Merkez Bankası	Private Bank
3	Türk Bankası LTD	Private Bank
4	Limasol Türk Koop Bankası LTD	Private Bank
5	Asbank LTD	Private Bank
6	Kıbrıs İktisat Bankası LTD	Private Bank
7	Nova Bank LTD	Private Bank

8	CreditWest Bank LTD	Private Bank
9	Yakın Doğu Bank LTD	Private Bank
10	Şekerbank Kıbrıs LTD	Private Bank
11	Akfinans Bank LTD	Private Bank
12	Universal Bank LTD	Private Bank
13	Viya Bank LTD	Private Bank
14	Kıbrıs Faisal İslam Bankası LTD	Private Bank
15	T.C Ziraat Bankası	Branch Bank
16	T.C Halk Bankası	Branch Bank
17	Türkiye İş Bankası	Branch Bank
18	Türkiye Garanti Bankası	Branch Bank

3.1.2 Data Source

The secondary data are from the TRNC Central Bank's officially published sources and the Republic of Turkey central bank online database. Total assets, total loans, total deposits, non-performing loans, and return on equity are bank-specific data. Furthermore, inflation, interest rate, instability index, exchange, and GNP growth are macroeconomic indicators proxy to monetary policy in the study. The table below shows the sources of the variables used:

Table 3.2: Sources of Variables

NAME OF VARIABLE	**INDICATOR**	**SOURCE**
GNP	Gross National Product Growth	TRNC State Planning Organization
EXC	Exchange Rate (Dollar rate)	Republic of Turkey Central Bank online database
INF	Inflation Rate	TRNC State Planning Organization
INT	Interest Rate (Rediscount Rate)	Republic of Turkey Central Bank online database
INS	Instability Index	İsmihan (2012)

ROE	Return on Equity	TRNC Central Bank
ROA	Return on Asset	TRNC Central Bank
NPL	Non-performing Loan	TRNC Central Bank
TOTAS	Total Assets	TRNC Central Bank
TOTLOA	Total Loans	TRNC Central Bank
TOTDEP	Total Deposits	TRNC Central Bank
LODEP	Total Loans/Total Deposits	Calculated by Researcher

Gross national product (GNP) measures the contribution of citizens to the growth of their nation's economy. GNP is the total value of all finished goods and services produced by a country's citizens in a given financial year, irrespective of their location. Also, it takes into account the output generated by a country's businesses located domestically or abroad. It tends to supers gross domestic product (GDP) since it considers the net overseas economic activities performed by a country's citizens. Whereas GDP limits its economic analysis to the geographical borders of a country. This variable is derived by the addition of total GDP and net income from abroad. The net income from abroad means the net income earned by domestic residents from overseas investments minus net income earned by foreign residents from domestic investments. Moreover, the GNP growth, which is the variable used in the study, is the changes of GNP from one year to the next. IT ought to have a positive reaction with the banking performance, where an increase in GNP growth induces an increase in banks performance (Business-standard, n.d.).

The Exchange Rate is the value of one nation's currency versus the currency of another nation or economic zone (Chen, 2020). Foreign exchange rate fluctuations affect banks both directly and indirectly. The direct effect comes from banks' holdings of assets (or liabilities) with net payment streams denominated in a foreign currency (Popper, 1996). However, the inflation rate is the general rise in the price

level of goods and services in an economy. Wholesale Price Index (WPI) and Consumer Price Index (CPI) are the common proxy of the inflation rate. Inflation allows banks to adjust the interest rates accordingly, which results in faster growth of revenues than costs, with a positive impact on profitability (Tan and Floros, 2012).

Interest rate is the amount a lender charges for the use of assets expressed as a percentage of the principal (Banton, 2020). These assets can be cash, consumer goods, vehicles, etc. When interest rates are higher, banks make more money by taking advantage of the difference between the interest banks pay to depositors (customers) and the interest the bank can earn by investing (i.e. lending) (Hall, 2019). The rediscount rate is selected as a proxy to the interest rate. Furthermore, the instability index measures the changes in business activities, inflation, interest rate determinants, and exchange rate following the national fiscal and monetary policies (Ali and Rehman, 2015).

Total assets are the combination of a company's total fixed and current assets. In the banking sector, total assets are mainly loans, which are the sum of all loans banks offer to their borrowers. The increase of both total assets and loans is known to increase the level of performance in the banking system. In addition, the return on equity (ROE) is an instrument used to measure a bank's profitability. It's calculated as a company's net income divided by its total equity (Fernando, 2021). The ROA is the net income of a bank divided by its total assets, and it is also an instrument of a bank's profitability.

Total deposits are the total amount of money deposited in the bank, which can be in the form of demands deposits, term deposits, and Interest and Non-Interest bearing

deposits (Kagan, 2020). This helps banks to function well by allowing the circulation of money in the system. While, a non-performing loan is a loan in which the borrower is default and hasn't made any scheduled payments of principal or interest for some time (Segal, 2021). This tends to decrease the cash flows in the banking system. Bank's liquidity is total loans divided by total deposits in a bank, and it measures the liquidity of a bank, where its rise increases the earnings of banks.

3.2 Methodology

The existence of a relationship between the monetary policy variables and the banking performance in TRNC is examined with the aid of the Ordinary Least-Square method of econometric. Here, our dependent variables are return on equity, non-performing loans, total assets, total loans, and total deposits, which represent the banking performance in TRNC. On the other hand, our independent variables are the monetary policy variables GNP growth, instability index, exchange, inflation, and interest rate. The goal is to find out the connection between banking performance in TRNC and Turkey's monetary policy. There would be series of dependent variables equating to the monetary policy variables to test the relationship. The Hausman method would also be used to pick the best OLS models for use in the study. The OLS regression is as follows:

$$BPI = c + \beta MPI + \mu_t \quad (1)$$

Where BPI represent banking indicators in TRNC and MPI represent the macroeconomic indicators. In addition, c, β, and μ_t represent the constant, coefficient, and error term respectively. The followings are the contracted models to be estimated in the study:

$$LNTOTAS = c + \beta_1 GNP + \beta_2 INS + \beta_3 INT + \beta_4 LNTOTDEP + \beta_5 LODEP + \beta_6 LNNPL$$

$$LNTOTAS = c + \mu_1 GNP + \mu_2 INT + \mu_3 EXC + \mu_4 INF + \mu_5 LNTOTDEP + \mu_6 LODEP + \mu_7 LNNPL$$

$$LNTOTLOA = c + \rho_1 GNP + \rho_2 INS + \rho_3 INT + \rho_4 LNTOTDEP + \rho_5 LODEP + \rho_6 LNNPL$$

$$LNTOTLOA = c + \varphi_1 GNP + \varphi_2 INT + \varphi_3 EXC + \varphi_4 INF + \varphi_5 LNTOTDEP + \varphi_6 LODEP + \varphi_7 LNNPL$$

$$LNTOTDEP = c + \eta_1 GNP + \eta_2 INS + \eta_3 INT + \eta_4 LNTOTAS + \eta_5 LODEP + \eta_6 LNNPL$$

$$LNTOTDEP = c + \phi_1 GNP + \phi_2 INT + \phi_3 EXC + \phi_4 INF + \phi_5 LNTOTAS + \phi_6 LODEP + \phi_7 LNNPL$$

$$LNNPL = c + \Omega_1 GNP + \Omega_2 INS + \Omega_3 INT + \Omega_4 LNTOTAS + \Omega_5 LNTOTDEP + \Omega_6 LODEP$$

$$LNNPL = c + \sigma_1 GNP + \sigma_2 INT + \sigma_3 EXC + \sigma_4 INF + \sigma_5 LNTOTAS + \sigma_6 LNTOTDEP + \sigma_7 LODEP$$

$$ROE = c + \theta_1 GNP + \theta_2 INS + \theta_3 INT + \theta_4 LNTOTAS + \theta_5 LNTOTDEP + \theta_6 LODEP + \theta_7 LNNPL$$

$$ROE = c + \beta_1 GNP + \beta_2 INT + \beta_3 EXC + \beta_4 INF + \beta_5 LNTOTAS + \beta_6 TOTDEP + \beta_7 LODEP + \beta_8 LNNPL$$

$$ROA = c + \delta_1 GNP + \delta_2 INS + \delta_3 INT + \delta_4 LNTOTAS + \delta_5 LNTOTDEP + \delta_6 LODEP + \delta_7 LNNPL$$

$$ROA = c + \upsilon_1 GNP + \upsilon_2 INT + \upsilon_3 EXC + \upsilon_4 INF + \upsilon_5 LNTOTAS + \upsilon_6 TOTDEP + \upsilon_7 LODEP + \upsilon_8 LNNPL$$

LN = Logarithm form

GNP = Gross national product growth

ROE = Return on equity

ROA = Return on assets

TOTAS = Total assets

TOTDEP = Total deposits

TOTLOA = Total loans

NPL = Non-performing loans

INS = Instability Index

INT = Interest rate

EXC = Exchange rate

INF = Inflation rate

LODEP = Banks' Liquidity (Loan/Deposit).

3.2.1 Hausman Test

The Hausman test detects endogenous estimators in a regression model and evaluates correspondence of the statistical model to the data. Moreover, one of the assumptions of OLS is that there is no correlation between endogenous regressors and the error term. This is what the Hausman test will do (Glen**,** 2021). However, before it is concluded on the best regression method, there is the need to figure out if endogenous estimators are endogenous or not.

In panel data, the Hausman test can help to choose between a fixed-effect model and a random-effects model. The null hypothesis is that the preferred model is random effects, while the alternative hypothesis is that the model has fixed effects. The tests essentially examined the correlation between the unique errors and the estimators in the model. The null hypothesis is that there is no correlation between the two. When the p-value is small (less than 0.05), reject the null hypothesis and, the opposite is the case if the p-value is higher. This test is also known as the Hausman specification

test or Durbin–Wu–Hausman (DWH), gotten from the names of econometricians named James Durbin, De-Min Wu, and Jerry A.

Chapter 4

EMPIRICAL FINDINGS

The research methods conducted would be presented in this chapter, showing the findings of the connection between Turkish monetary policy and the performance of the TRNC banking system and finally discussing the results.

4.1 Statistical summary of variables

Table 4.1 shows the descriptive statistics of all the variables used in the research models. The maximum and minimum values show indications of significant variations in the ratios over the period of study, while the standard deviation shows the fluctuation of the variables. All the dependent and control variables such as total assets, total deposits, total loans, and return on assets fluctuate at a high degree, whereas, the explanatory variables are low in fluctuations except for the exchange rate. The total observation for all variables is 288 observations. Table 4.2 indicates the multicollinearity test of the variables to check for their correlation. When the relatedness is above 85%, there exists a high correlation whether positive or negative, and indicates the presence of multicollinearity among variables. From the result, it can be said that there is an existence of multicollinearity in the study's explanatory and control variables. This high correlation is 96%, 92%, and 89% between total assets and total deposits, total assets, and total loans, and finally total loans and total deposits, respectively. As a result, these variables will not be used together as explanatory and control variables.

Table 4.1: Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis	Obs.
ROE	0.253	0.196	3.454	-3.599	0.421	-0.486	38.27	288
ROA	0.017	0.012	0.221	-0.103	0.029	1.984	16.73	288
LNNPL	15.64	16.40	19.20	8.565	2.226	-0.846	2.863	288
LNTOTAS	19.50	19.66	22.80	14.48	1.528	-0.630	3.408	288
LNTOTLOA	18.60	18.79	22.29	9.861	1.975	-1.395	6.247	288
LNTOTDEP	19.16	19.52	22.70	11.31	1.859	-1.295	5.605	288
GNP	0.052	0.039	0.200	-0.057	0.067	0.645	2.703	288
EXC	2.332	1.735	5.675	1.296	1.293	1.428	3.868	288
INS	0.151	0.142	0.278	0.059	0.071	0.309	1.774	288
INF	0.111	0.102	0.299	0.027	0.067	1.108	4.311	288
INT	0.171	0.145	0.38	0.087	0.081	0.973	3.257	288
LODEP	0.971	0.977	1.312	0.729	0.054	0.367	13.75	288

Table 4.2: Correlation Matrix

	ROE	ROA	LNNPL	LNTOTAS	LNTOTLOA	LNTOTDEP	GNP	EXC	INS	INF	INT	LODEP
ROE	1											
ROA	0.41	1										
LNNPL	0.02	0.02	1									
LNTOTAS	0.19	-0.04	0.67	1								
LNTOTLOA	0.13	0.00	0.77	0.92	1							

LNTOTDEP	0.26	-0.10	0.60	0.96	0.89	1						
GNP	0.07	-0.00	-0.08	-0.02	-0.07	-0.03	1					
EXC	-0.07	-0.04	0.42	0.47	0.44	0.42	0.30	1				
INS	0.01	-0.02	0.13	0.12	0.09	0.11	0.06	0.35	1			
INF	-0.00	0.02	0.14	0.19	0.15	0.15	0.10	0.53	0.06	1		
INT	0.23	0.11	-0.45	-0.42	-0.46	-0.39	0.30	-0.42	-0.07	0.19	1	
LODEP	0.27	0.20	0.45	0.08	0.37	0.07	0.07	0.09	0.04	0.02	0.18	1

4.2 Empirical Results

As a result of no sign of the Hausman test regarding fixed or random effect, the random effect was seen chosen for all models run in this study. In the first step, the impact of the monetary policy proxied by interest rates and macroeconomic variables on the performance (ROE and ROA) of the Banking sector in TRNC has been estimated. In this respect, the impact of interest rates, instability index, GNP growth, and as control variables total deposits, bank's liquidity (total loans to total deposit), non-performing loans on the banking sector profitability of TRNC through the return on equity has been estimated and presented in Table 4.3. It shows that interest rate has a positive and significant effect on equity, where a 1% rise in the Turkish's interest rate with other variables fixed would result in an increase of 1.952 towards banks' profitability in TRNC. This also means a rise in interest rate, shows the shareholders’ capital being highly utilized. In addition, the total deposits have a favorable impact on return on equity, with a rise in total deposits assisting TRNC banks in increasing their profitability. However, a bank's liquidity inserts a negative impact on banks profitability through ROE, where a rise in the ratio would result in a decrease in banks' ROE in TRNC.

Table 4.3: Model (1) the ROE random effect results with GNP growth, INS, INT, LODEP, TOTDEP, and NPL.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	-0.301783	0.188149
GNP	-0.201548	-0.221774
INS	-0.057145	-0.094450
INT	1.9524***	1.9275***
LNTOTDEP	0.0825***	0.0895***
LODEP	-1.5841***	-2.1991***
LNNPL	0.012544	0.011497
R-squared	0.240797	0.232141
Adjusted R-squared	0.224587	0.215746
S.E. of regression	0.370943	0.342055
F-statistic	14.85419	14.15878
Prob(F-statistic)	0	0
Sum squared resid	38.66517	32.87736
Durbin-Watson stat	1.434045	1.666308

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Finally, the instability index shows no sign of significance, which means no relationship exists. It also means in a situation of instability in the Turkish economy, the banking sector's ROE is not affected in TRNC. Interestingly, growth in the economy of TRNC proxied by GNP growth as well as non-performing loans is found not to have a significant impact on the profitability of TRNC banks. R-squared and adjusted R-squared shows a percentage less than 50%, which means the explanatory variables do not explain enough of the ROE of TRNC banks. This is in line with San and Heng (2013) study, which looked at the link between bank profitability and GDP growth rate, liquidity, asset quality, efficiency, capital, bank size, and inflation. Their findings show a low r-square and adjusted r-square of 22% and 17.8%, respectively, thereby stating that more important variables are to be considered.

The model in Table 4.4 where the instability is decomposed to inflation, exchange rate changes shows similar results concerning the impact of GNP growth and non-performing loans on the ROE. The study finds that interest rate, total deposits, bank liquidity, and inflation rate significantly affect the profitability of banks in TRNC. The inflation rate hurts the profitability of TRNC banks, with a rise in the rate reducing bank profitability in the TRNC. This is consistent with Okumuş, (2002) result, where he found an increase in inflation decreases the profitability of banks in Turkey. The interest rate, and total deposits, on the other hand, contribute positively to profitability. When Turkey's interest rate increases, the banks' profitability in TRNC increases. This occurs when banks take advantage of the interest rate differential between what they pay to their customers and what they earn on their investments (Hall, 2019). The exchange rate, on the other hand, is found to have no significant relationship with ROE, which implies that a change in the rate would have no impact on the profitability of TRNC banks. This result is contrary to Ali et al, (2018) result, stating that a rise exchange rate may significantly increase the profitability of Bruneian Islamic banks. In addition, the bank's liquidity shows a negative contribution towards the ROE of TRNC banks. The R-squared and adjusted R-squared show a lower explanation of the independent variables towards the ROE.

Table 4.4: Model (2) the ROE random effect model with GNP, EXC, INF, INT, TOTDEP, LODEP, and NPL

Variables	Estimation method	
	OLS	Crossed-section random effect
C	-0.553262	-0.379483
GNP	-0.394711	-0.346361
EXC	0.025014	0.012665
INF	-1.312876**	-1.2985***
INT	2.5040***	2.5599***
LNTOTDEP	0.0888***	0.1067***
LODEP	-1.5226***	-2.1268***

LNNPL	0.016715	0.022159
R-squared	0.265675	0.264241
Adjusted R-squared	0.247317	0.245847
S.E. of regression	0.365465	0.334827
F-statistic	14.47181	14.36560
Prob(F-statistic)	0	0
Sum squared resid	37.39818	31.39060
Durbin-Watson stat	1.428093	1.670060

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

In the relationship of banking performance (ROA) with the involvement of both bank-specific factors and macroeconomic variables. Table 4.5 findings noted only interest rate that has a relationship with banks' ROA in TRNC, while other variables do not. It implies that an increase in interest rate tends to hike the performance of banks through the return on assets. Furthermore, table 4.6 reveals a similar result of only interest rate inserting a positive impact on the ROA of TRNC banks.

Table 4.5: Model (3) ROA with GNP growth, Instability index, Interest rate, Total deposits, Liquidity, and Non-performing loans.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	-0.105069**	-0.065075
GNP	-0.016055	-0.019566
INS	-0.000697	-0.007157
INT	0.057715**	0.0646***
LNTOTDEP	-0.000396	0.000489
LODEP	0.1231***	0.055315
LNNPL	0.000103	0.000672
R-squared	0.069361	0.035253
Adjusted R-squared	0.049490	0.014653
S.E. of regression	0.028415	0.024272
F-statistic	3.490505	1.711344
Prob(F-statistic)	0.002407	0.118222
Sum squared resid	0.226882	0.165550
Durbin-Watson stat	1.282226	1.754307

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.6: Model (4) ROA with GNP growth, Exchange rate, Interest rate, Inflation, TOTDEP, LODEP, and NPL

Variables	Estimation method	
	OLS	Crossed-section random effect
C	-0.109176**	-0.070666
GNP	-0.032174	-0.028325
EXC	0.001925	0.001000
INF	-0.022803	-0.019722
INT	0.076935**	0.077069**
TOTDEP	-0.000448	0.000527
LODEP	0.1254***	0.058511
NPL	0.000601	0.000600
R-squared	0.071070	0.035956
Adjusted R-squared	0.047847	0.011855
S.E. of regression	0.028440	0.024309
F-statistic	3.060292	1.491879
Prob(F-statistic)	0.004038	0.169896
Sum squared resid	0.226466	0.165463
Durbin-Watson stat	1.285808	1.759402

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.7 focuses on the relationship of interest rate, instability index, GNP growth, total assets, and bank's liquidity on the TRNC banks' non-performing loans. The result shows only GNP growth with no significant impact on non-performing loans. The interest rate, on the other hand, has a negative impact on the NPL, as an increase in Turkey's interest rate causes the banks' NPL in the TRNC to plummet. This is contrary in Pakistan, where the interest rate induces a positive reaction towards NPL (Siddiqui, Malik, & Shah, 2012). Furthermore, the instability index, total assets, and liquidity all have a positive effect on the NPL of TRNC banks, where a rise in any would increase the NPL of banks in TRNC. When Turkey's economy is unstable, the failure of loan payments in the TRNC is more likely to occur.

Table 4.7: Model (5) NPL with GNP growth, Bank's liquidity, Interest rate, Total Assets, and Instability Index.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	-15.918***	-9.9901***
GNP	-0.420809	-0.879925
INS	2.290947**	1.629935**
INT	-3.3802***	-3.2060***
LNTOTAS	0.8501***	1.0090***
LODEP	15.686***	6.4891***
R-squared	0.639258	0.708369
Adjusted R-squared	0.632862	0.703198
S.E. of regression	1.349242	0.853532
F-statistic	99.94461	136.9951
Prob(F-statistic)	0	0
Sum squared resid	513.3680	205.4419
Durbin-Watson stat	0.350999	0.549048

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Moreover, Table 4.8 findings show all variables significant towards the NPL in TRNC banks except for inflation. The exchange rate, bank's liquidity, and total assets all show positive effects on the NPL of TRNC banks, whereas GNP growth and interest rates have negative effects. The result shows that if Turkey's interest rate and TRNC GNP growth rise, the non-performing loans of TRNC banks would decline, implying that economic growth mitigates the level of non-performing loans.

Table 4.8: Model (6) Bank efficiency (NPL) with Exchange rate, Total assets, Bank's liquidity, Interest rate, GNP growth, and Inflation rate.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	-15.250***	-7.3141***
GNP	-2.134962	-1.984289**
EXC	0.226869*	0.180907**
INF	-0.644179	0.052142
INT	-1.815914	-3.022228**
LNTOTAS	0.8120***	0.8597***
LODEP	15.466***	6.5715***

R-squared	0.641086	0.710814
Adjusted R-squared	0.633422	0.704639
S.E. of regression	1.348212	0.851479
F-statistic	83.65293	115.1155
Prob(F-statistic)	0	0
Sum squared resid	510.7670	203.7296
Durbin-Watson stat	0.338134	0.534453

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

In the case of the association of total assets with an interest rate, instability, GNP growth, total deposits, liquidity, and non-performing loans, it shows a positive communication of GNP growth, total deposits, liquidity, and non-performing loan towards the total assets in table 4.9. Whereas interest rates insert a negative impact on the bank size. A mixed result of the positive and negative impact of the variables on bank size was also presented in table 4.10. GNP growth shows no significant effect, whereas exchange rates, inflation, total deposits, bank liquidity, and non-performing loan all have a positive impact on bank size in the TRNC. As for the interest rate the impact is estimated to be negative. In both models, the R-squared and adjusted R-squared are high of 90%, which means the explanatory variables explained 90% of the total assets of TRNC banks.

Table 4.9: Model (7) Bank efficiency (bank size) with GNP growth, Instability index, Interest rates, Total deposits, Bank's liquidity, and Non-performing loans.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	0.680145	2.2319***
GNP	0.569098***	0.8063***
INS	0.182157	0.272740
INT	-0.322493	-0.7879***
LNTOTDEP	0.770483***	0.6266***
LODEP	3.696902***	3.8689***
LNNPL	0.029673*	0.0993***
R-squared	0.948938	0.938803

Adjusted R-squared	0.947848	0.937496
S.E. of regression	0.349137	0.248937
F-statistic	870.3542	718.4529
Prob(F-statistic)	0.000303	0
Sum squared resid	34.25298	17.41350
Durbin-Watson stat	0.610053	0.716102

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.10: Model (8) Bank efficiency (bank size) with Exchange rate, Interest rate, GNP growth, Inflation rate, Total deposits, Bank's liquidity, and Non-performing loans.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	0.844535	3.9158***
GNP	0.353839	0.163537
INT	-0.349646	-1.1498***
EXC	0.025430	0.0945***
INF	0.625731	0.8053***
LNTOTDEP	0.7631***	0.5582***
LODEP	3.6696***	3.7933***
LNNPL	0.024300	0.0691***
R-squared	0.950400	0.952094
Adjusted R-squared	0.949161	0.950897
S.E. of regression	0.344715	0.216866
F-statistic	766.4597	794.9724
Prob(F-statistic)	0	0
Sum squared resid	33.27199	13.16859
Durbin-Watson stat	0.583496	0.584770

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.11 shows the relationship of interest rate, instability, GNP growth, total deposits, liquidity, and non-performing loans towards the total loans in TRNC banks. The results indicate the connection of interest rate, total deposit, non-performing loans, and leverage ratio on the TRNC banks' total loans. With increases of 0.96, 15.3, and 0.017, the total deposit, liquidity, and non-performing loans, respectively, have a favorable impact on the banks' loans. The interest rate, on the other hand, hurts total loans, with a rise in the rate resulting in a reduction of 0.405 in bank loans

in the TRNC. Furthermore, table 4.12 shows a positive impact of non-performing loans, liquidity ratio, total deposits, and a negative influence of interest rate on banks in TRNC. GNP growth was shown to not affect both models on the banks' total loans, implying that its changes do not affect banks' total loans in TRNC. The R-squared and adjusted R-squared indicate a high explanation of the independent variables towards the total loans.

Table 4.11: Model (9) Bank efficiency (TOTLOA) with GNP growth, Instability index, Interest rates, Total deposits, Bank's liquidity, and Non-performing loans.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	-15.010***	-15.101***
GNP	-0.137693	-0.157874
INS	-0.027398	-0.034382
INT	-0.4325***	-0.4054***
LNTOTDEP	0.9569***	0.9697***
LODEP	15.427***	15.379***
LNNPL	0.0241***	0.0171***
R-squared	0.996516	0.995246
Adjusted R-squared	0.996442	0.995145
S.E. of regression	0.117835	0.107760
F-statistic	13395.30	9804.891
Prob(F-statistic)	0	0
Sum squared resid	3.901714	3.263009
Durbin-Watson stat	0.813937	0.884453

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.12: Model (10) Bank efficiency (TOTLOA) with Exchange rate, Interest rate, GNP growth, Inflation rate, Total deposits, Bank's liquidity, and Non-performing loans.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	-14.999***	-15.092***
GNP	-0.109532	-0.106917
INT	-0.4855***	-0.4765***
EXC	-0.003789	-0.006529
INF	0.100388	0.102305

LNTOTDEP	0.9567***	0.9699***
LODEP	15.427***	15.378***
LNNPL	0.0238***	0.0170***
R-squared	0.996520	0.995252
Adjusted R-squared	0.996433	0.995134
S.E. of regression	0.117981	0.107888
F-statistic	11453.39	8385.114
Prob(F-statistic)	0	0
Sum squared resid	3.897452	3.259139
Durbin-Watson stat	0.810730	0.882953

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.13 shows total assets with a positive impact on the total deposits and instability with no effect. The size of banks in the TRNC is often linked to total deposits, as the size of a bank attracts depositors to put their money there. A negative impact of the total deposits is contributed by the changes in TRNC banks' liquidity and GNP growth. However, Table 4.14 shows the exchange rate, GNP growth, inflation, non-performing loans, and interest rate, with no significance towards the total deposits of TRNC banks except for the bank's liquidity and size. Liquidity contributes negatively to the total deposits of TRNC banks, meaning that if they rise, banks' total deposits will fall. Such could be banks relying on debt to sustain their operations, which could terrify depositors into thinking of bank bankruptcy, thereby leading to low deposits. Total assets, on the other hand, have a favorable impact on TRNC banks. It goes in the opposite direction with the bank's liquidity, where an increase in a bank's assets attracts the depositing of funds by depositors.

Table 4.13: Model (11) Bank efficiency (TOTDEP) with GNP growth, Non-performing loans, Bank size, Interest rate, Bank's liquidity, and Instability index.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	1.9680***	1.325914*
GNP	-0.508511	-0.676885**

INT	-0.032290	0.083150
INS	-0.261587	-0.291035
LNTOTAS	1.1524***	1.2543***
LODEP	-5.9276***	-6.4462***
LNNPL	0.035107**	-0.019122
R-squared	0.948393	0.921839
Adjusted R-squared	0.947291	0.920171
S.E. of regression	0.427000	0.361346
F-statistic	860.6630	552.3610
Prob(F-statistic)	0	0
Sum squared resid	51.23441	36.69044
Durbin-Watson stat	0.647119	0.803133

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

Table 4.14: Model (12) Bank efficiency (TOTDEP) with Exchange rate, Interest rate, GNP growth, Non-performing loans, Liquidity, Total assets, and Inflation rate.

Variables	Estimation method	
	OLS	**Crossed-section random effect**
C	1.755467**	0.049221
GNP	-0.388882	-0.377075
EXC	-0.016026	-0.053620
INF	-0.576943	-0.742662
INT	0.052246	0.431318
LNTOTAS	1.1619***	1.3240***
LODEP	-5.8947***	-6.5667***
LNNPL	0.037469**	-0.011229
R-squared	0.948974	0.924498
Adjusted R-squared	0.947699	0.922611
S.E. of regression	0.425344	0.353067
F-statistic	743.9207	489.7904
Prob(F-statistic)	0	0
Sum squared resid	50.65699	34.90375
Durbin-Watson stat	0.640775	0.781939

Note: *=10%, **=5%, and ***=1% as level of significance to reject the null hypothesis.

From the above findings of the involvement of Turkey's monetary policy on the TRNC banks' performance, the involvement is seen highly through the interest rate channel. It inserts a positive impact on the ROA and ROE but a negative impact on

the NPL, total assets, and total loans. The economic growth rate is the next channel after the interest rate, which has a favorable impact on total assets but a negative impact on return on equity, total deposits, and non-performing loans of banks in TRNC. Instability, exchange, and inflation, on the other hand, were judged to have a less impact in TRNC due to their low contribution to banking performance indicators. The bank-specific indicators, when regress against the dependent variables, the existence of a significant relationship is seen.

Below are summary results of the hypotheses set at the beginning of the thesis.

Table 4.15: Summary of study's hypotheses

Hypotheses	**Result**
Turkish monetary policy has no impact on the return on equity of TRNC banks.	The null hypothesis here is rejected, resulting in the monetary policy in Turkey having an impact on the return on equity of the TRNC banking sector.
Turkish monetary policy has no impact on the return on assets of TRNC banks	Through the channel of interest rate, the monetary policy of Turkey affects the performance of TRNC banks. Therefore the null hypothesis is rejected.
Turkish monetary policy has no impact on the total assets of TRNC banks.	The null hypothesis is rejected because of the impact of Turkey's monetary policy on TRNC bank performance via the exchange rate and interest rate channels.
Turkish monetary policy has no impact on the NPL of TRNC banks.	The existence of a relationship between TRNC banks and Turkish monetary policy via both interest rate and exchange rate channels refutes

	the null hypothesis.
Turkish monetary policy has no impact on the total loans of TRNC banks.	The null hypothesis is rejected because interest rates affects the total loans of TRNC banks.
Turkish monetary policy has no impact on the total deposit of TRNC banks.	Here, the null hypothesis is not rejected due to Turkey's monetary policy not having an impact through any of its channels on the TRNC banks' performance.

Chapter 5

CONCLUSION

TRNC is a micro-size-serviced-based economy in the Eastern Mediterranean Sea that has very high economic relations with Turkey. TL is the legal tender in TRNC which makes the import-based economy to be in Lira -zone with Turkey. The developments both in the Turkish economy as well as specifically in the TL have led to the investigation of the impact of Turkey's monetary policy on the TRNC banking performance. The thesis analysis covers the period of 2004 to 2019. The study made use of EVIEWS to run the economic analysis. In running EVIEWS, the study used the ordinary least square method to run the relationship of Turkish monetary policy and banking performance in TRNC. In addition, the study adopted the OLS random effect model after running the Hausman test. Various models were run, which resulted in a wide range of responses of the bank-specific and macroeconomic indicators towards the banks' performance in TRNC. The findings indicate the presence of an impact and influence of Turkey's monetary policy on TRNC's bank's performance.

The interest rate has the highest impact on TRNC’s banking performance, having a positive impact on the banks’ efficiency, while a negative impact on the total loans, non-performance, and total assets. The increase of interest rate in Turkey tends to enhance the efficiency of banks in TRNC through its positive impact on ROE and ROA. On the other hand, it tends to decrease the size of loans of banks, which also

has an indirect effect on non-performing loans with a decrease. The changes in the value of TL affect non-performing loans and total assets of TRNC banks, implying that a decrease in the value of TL leads to an increase in the size of both total assets and non-performing loans in TRNC. This also means there is an occurrence of loans default when the Turkish lira changes. The instability index, which is developed by the use of budget deficit, trade deficit, inflation, and exchange rate change, demonstrates a positive impact through the NPLs. The default of loans in the Turkish Republic of Northern Cyprus tends to be affected by the instability in Turkey.

Furthermore, the TRNC macroeconomic indicators GNP growth and inflation show a significant relationship towards banking performance in TRNC. Inflation affects the banks' performance negatively through the channel of return on equity, while positively towards the total assets in TRNC. When the price of goods and services rises, the efficiency of banks in the TRNC falls as a result of a drop in deposits in the Banks. In addition, economic growth in TRNC tends to increase the size of banks, while it decreases the non-performing loans, returns on equity, and total deposits of TRNC banks. Finally, the bank-specific indicators show a significant relationship with the banks' performance in TRNC. The TRNC banks' total deposits and total assets insert a positive impact on the profitability and efficiency of banks, whereas the total loans and non-performing loans insert a mixed effect.

These results signal that developments in the Turkish economy and the decisions about monetary policy have to be followed closely. Particularly the interest rate, which has a high involvement on the banks' performance in TRNC. This is because its adjustments tend to be beneficial to banks' efficiency but not to their overall performance. These are issues that policymakers should consider. In addition, the

Turkish lira needs to be watched, as a result of its increase would increase the size of banks in TRNC, which perform more of its financial activities in the currency.

In future studies, to see the impact in more detail, banks can be grouped according to the ownership structure. Furthermore, ratios i.e. leverage ratios, and broad money can be used as explanatory factors.

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