A Comprehensive Analysis on Interest Rate Spread in North Cyprus: Panel Method, 2002-2012

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Science
in
Banking and Finance

Eastern Mediterranean University
February 2016
Gazimağusa, North Cyprus

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ABSTRACT

This study aims to measure and analyze determinants of interest rate spread in North Cyprus. In this respect, firstly spread is calculated. Then, analysis made to determine whether IRS is at high or reasonable rates for different types of spreads.

In literature review, many studies select various independent variables for empirical analysis to understand the determinants of IRS. In the light of this information North Cyprus case studied. In this respect, 18 banks selected from the banking system of North Cyprus and categorized into 3 groups; privately owned local banks, publicly owned banks and privately owned foreign branch banks. With the help of EViews 8 software program, descriptive statistics analysis performed and general statistics of three separate bank group and all banks obtained successfully.

In the analysis Panel Data Method has been employed. Sample period started from 2002 and ended 2012. Firstly, unit root tests performed and founded that all dependent and independent variables are stationary. Then, Ordinary Least Squares Method used to get final outcomes of this study. For different spread models, three different equation models were created. Hausman Test showed that in all of the models Random Effect Model is most appropriate effect model. Results of the different panel estimations give the detailed information about robust estimations of different spread models. In section 4.3, outcomes of this study were compared with other study results. In addition to this, critical points of this study underlined and make overall analysis on IRS. It was concluded that main determinants of the IRS in North Cyprus are Credit Risk, Liquidity Risk and Non-Performing Loans.

ÖZ

Bu çalışmada, Kuzey Kıbrıs'taki kredi-mevduat faiz farkı oranı ve bu oranın belirleyicileri değerlendirilmiştir. İlk olarak kredi-mevduat faiz farkı oranı hesaplanmıştır. Daha sonra ise yüksek veya güvenilir oranlarda olup olmadığı kararlaştırılmıştır. Öte yandan, literatürdende yararlanılarak farklı kredi-mevduat faiz farkı oranı hesaplaması tanımlamaları yapılarak farklı tipteki hesapları gerçekleştirilmiştir.

Literatür taramasında birçok çalışmanın çeşitli bağımsız değişkenleri ampirik analizlerde kullanarak kredi-mevduat faiz farkı oranının belirleyicilerini bulmaya ve yorumlaya çalıştıkları görülmüştür. Bu bilgiler ışığında Kuzey Kıbrıs ile ilgili olarak çalışma gerçekleştirildi. Kuzey Kıbrıs bankacılık sisteminden 18 banka seçilerek bankalar 3 grupta sınıflandırılmıştır. Bunlar; özel bankalar, kamu bankaları ve şube bankalarıdır. Merkez Bankası kaynakları doğrultusunda 3 farklı grubun kredi-mevduat faiz farkı oranları incelenerek hesaplanmıştır. Eviews 8 istatistik paket programı kullanılarak, 3 gruptaki bankaların gruplar halinde ve bütün olarak tanımlıyıcı istatistikleri başarılı bir şekilde elde edilmiştir.

Çalışmanın analizlerinde Panel Veri Yöntemi kullanılmıştır. Gerçekleştirilen modelde 2002 ile 2012 arası veriler kullanılmıştır. İlk olarak, birim kök testi gerçekleştirilerek kullanılmakta olan verilerin durağan olduğu tespit edilmiştir. Bundan dolayı, En Küçük Kareler Yöntemi gerçekleştirilerek sonuçlar elde edilmiştir. Kredi-Mevduat Faiz Farkı oranları için üç farklı denklem modeli oluşturulmuştur. Hausman Testi gerçekleştirilerek Rastsal Etki Modeli ile

tahminlerin gerçekleştirilmesi kararlaştırılmıştır. Gerçekleştirilmiş olan farklı panel tahminlerinde detaylı bir şekilde sağlam (robust) tahminler elde edilmiştir. Bu çalışmanın sonuçları 4.3'üncü bölümde diğer çalışma sonuçları ile karşılaştırılmıştır. Buna ek olarak, çalışmanın kritik noktalarından bahssedilip, Kredi-Mevduat Faiz Farkı oranı ile ilgili genel analizler yapılmıştır. Bunun sonucunda, Kuzey Kıbrıs'taki Kredi-Mevduat Faiz Farkı oranının başlıca belirleyicilerinin Kredi Riski, Likidite Riski ve Takipteki Alacaklar olduğu tespit edilmiştir.

Anahtar Kelimeler: Kredi-Mevduat Faiz Farkı, Kuzey Kıbrıs, Kredi Riski, Takipteki Alacaklar, Likidite Riski

To My Grandfather Kenan Pars and My Fiance Seda Esen

ACKNOWLEDGMENT

I would like to thank Prof. Dr. Mustafa Besim for all his guidance, support, and encouragement through helping me complete this thesis. Secondly, I would like to thank my friend PhD student Boren Sargon, for helping with the methodology area of my thesis.

I also would like to thank my father Esat Dünki and my mother Gülnaz Dünki for all their support and encouragement through all my life. Thank you Esat Dünki and Gülnaz Dünki.

My special thanks goes to meaning of my life and my angel SEDA ESEN for all her support and encouragement through helping me accomplish this thesis. Without her it would have not be easy.

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LIST OF ABBREVIATIONS

ADF   Augmented Dickey-Fuller

CB   Central Bank

CR   Credit Risks

DCRISIS   Dummy Variable of 2009 and after

DFOR   Dummy Variable of Foreign Banks

GDP   Gross Domestic Product

HHI   Herfindahl-Hirschman Index

IMF   International Monetary Fund

INF   Inflation Level

IRS   Interest Rate Spread

LR   Liquidity Risk

MM   Money Market

MP   Market Power

NBER   National Bureau of Economic Research

NIM   Net Interest Margin

NPL   Non-Performing Loans

OC   Operating Cost

OLS   Ordinary Least Squares

PP   Phillip Perron

RGR   Real Growth Rate

RR   Required Reserve

TL   Turkish Lira

TRNC   Turkish Republic of Northern Cyprus

Chapter 1

INTRODUCTION

1.1 Background to the Study

When research is made on Interest Rate Spread (IRS), it is recognized that there are many different spreads and these spreads are used for different purposes. Also, these calculations missions are distinct from each other and interest rate spreads use for predicting the direction of the economy. Our objective is to evaluate and understand 'interest rate spread between deposit rates and credit rates in North Cyprus'. In this respect, we want to calculate what the spread is. Then, decide whether it is high or reasonable rates. We divide IRS in two parts: one of them is Deposit interest rate and the other one is Loan interest rate.

Briefly, IRS can be defined as the lending rate minus deposit rate. However in the literature, there are multiple different measurement techniques for calculation of interest rate spread. Also researchers do not use only simple and basic technique, they use measurement technique, which are suitable for this to make empirical analysis or they make decision with the help of their data availability. For instance, they look for the availability of income statement and balance sheet items. Then if there are enough resources, they use these resources for their empirical analysis, these resources are; availability of appropriate and sufficient data, transparency of available data and suitability of selected data. Initially researchers try to investigate literature and then they make decision for using appropriate methodology. They try

to develop new measurement techniques and empirical models or improve old measurement techniques and empirical models. Many researches find evidence that IRS being a problem in many countries. For instance, Folawewo and Tennant (2008) argued that banks in Sub-Saharan African Countries try to protect against the increased risk with the help of increasing the level of spreads. Hossain (2010) stated that if the level of spread is high this being a problem in front of the economic development of financial sector and system in Bangladesh. On the other hand, (Beck and Hesse, 2009) tried to explain reasons for high IRSs in Uganda. Also they mention that domestic banks charge higher IRSs than foreign banks. Nampewo (2012) said that Uganda's financial sector development is negatively affected from high IRSs and also add that the reason for high IRSs in Uganda is high operational efficiency and lack of competition in financial sector. Brock and Suarez (2000) specify that many industrial countries try to cover intermediation costs with increasing level of IRS and add that high cost of intermediation being a reason for high level of IRS in Latin America and decrease the economic development in Latin America. Bernanke (1990) specify that IRS and interest rate are most effective predictors of the economic system.

1.2 Statement of the Problem

In North Cyprus, banking sector plays a key determinant role on the island economy, especially for provision of credits and mobilization of savings. The levels of IRS in North Cyprus looks to be high where deposit interest rate is approximately 10 %, whereas loan interest rate is approximately more than 15 % and plus. When we look at "Turkish Cypriot Chamber of Commerce Competitiveness Report" in different periods, we see that in 2008-09 IRS level of North Cyprus was 11.6%, in 2009-10 IRS level is 10.24% and in 2011-12 IRS level was 10.6%. This situation shows us

that the level of IRS is high. In addition, this spread affects negatively all of our sectors. Because most of our sectors dependent to financial intermediaries to make investment. Vera, Sequin and Faust (2007) specify that if country has high level of IRS, this situation diminishes the level of investment and domestic real savings, thus economy fall into recession period.

In this study, we try to compare our IRS levels with other countries. A lot of studies show us many countries faced with this problem. Finance literature demonstrates that especially developing countries suffered from this spread. Folawewo and Tennant (2008) said that the high level of IRS reasons are; banks try to maximize their profit margin and the other one high IRS expand with the help of macroeconomic environment and institutional regulatory.

One of the most important problems of North Cyprus, real sectors does not have sufficient resources and equity is very low. So companies, firms and all of the other business entities try to use bank credit to finance their activities. But when the problem is studied in depth, it is observed that there is a problem with access to finance. In addition, North Cyprus is not recognized country. These problems complicate to North Cyprus life standards.

Finally, we have also different problems in North Cyprus. These problems are external and internal. External problems are because of political conflicts which lead to property ownership problem and there are barriers to accessing into international financial markets. On the other hand, internal problems are institutionalizations of the businesses are not enough and there are deficiencies in legal system.

1.3 Purpose of the Study

The purpose of this study is to investigate and understand 'interest rate spread between credit rates and deposit rates in North Cyprus'. Hence, we try to measure the spread of North Cyprus, analyze spread in North Cyprus and finally try to determine the sources of spread. The objective is to look into the roots and causes of the Interest Rate Spread. This study's aim is look into roots of the problem. In this respect, many studies specify that banks give low interest rates on deposits, but they charge high interest rates to loan. Everywhere in the world banks try to make profit with the help of this spread. In contrast, real sector faces with difficulties in repayment. Generally, spread between loan and deposit interest is positive and very high in developing and non-developed countries' economies, in addition to this, spread of strong economies and super power countries are positive except these countries ratios are very low.

On the other hand, in the time of global financial crisis every economy in the world was affected negatively from this spread. Quaden (2004) gives an example of strong and efficient banking system. He argued that strong bank should give profitable returns for depositors and transfer the advantage of lower borrowing costs or intermediary cost to creditors.

1.4 Significance of the Study

There has not been any study done with the calculation of Interest Rate Spread in North Cyprus. In addition, determinants of IRS have also been analyzed. It is expected that this study will shed some light to the policy makers in the North Cyprus to minimize IRS problem.

1.5 Organization of the Study

This research is organized into five sections. The first section is introduction part. Second section is literature review related with IRS. The third chapter deals with the methodology and data of interest rate spread. The fourth chapter outlines the analysis on IRS. In chapter five we make our comments and present some conclusions and policy implications.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

This section will explain Interest Rate Spread (IRS) benefiting from the literature. The section will also provide detailed information about different stages of IRS.

2.2 Definition of Interest Rate Spread

A very general definition of IRS is the gap between deposit rates and credit rates. Interest rate spread refers to the difference between a company's cost of borrowing and the interest rate it can earn on its money. According to Khawaja and Din (2007) IRS is defined as what a bank gain from its assets and what a bank to pay out for its responsibilities. According to Koyuncu (2010) IRS is calculated by "taking total interest received by banks on loans during one year divided by total loans and subtracting interest paid on deposits throughout year divided by total deposits" (p. 67). This gap composes a spread. Every bank in the world earns money from this gap.

In every economy, but generally in developing countries, credit rate is much more than deposit rate. So, this situation gives chance to banks to make a profit that is higher than under normal circumstances. In the light of this information and also many studies show that there is positive correlation between IRS and profitability of the banks. Randall (1998) specified that the elasticity of loan demand in connection with credit rate, on the other hand, elasticity of credit supply in connection with

deposit rate and also manufacture cost in connection with deposits are calculated and used for forecasting.

2.2.1 Sections of Interest Rate Spread

Interest Rate Spread derived with the help of two components. First component is credit rate and second component is deposit rate. This means that IRS is divided into parts of profit and cost. We know that if financial intermediation costs raises, this situation also raises the credit rate level, in other words the burden on the side of borrowers' increases more than previous days. Consequently we know that through the agency of literature an upward trend for interest rate spread indicates that either borrower or depositor side or both side of interest rate spread affected negatively from changing trend.

Tennant (2008) argued that improvement and developments of low level income countries had negative effect on IRS. In addition, economic crisis affects spread on bad way, because firms, companies and customers who use credit from the banks are faced with high loan interest rates. So this means that if every goods and services in economy becomes expensive with the help of cost of goods sold, this changing trend effects purchasing power negatively and customer do not buy anything. In additionally, firms do not pay their debts to banks. Also (Gertler, Hubbard and Kashyap, 1990) added that financial intermediaries raise the interest rates of risky borrowers' assets more than reliable borrowers' assets in the time of panic periods or crisis periods.

In the banking world, credits are divided into different sections. These sections are; housing credits, corporate credits, automobile credits and cash credits. Aydin (2007) found that housing credits are highly responsive to changes in policy rates. Cash and

automobile credits also are a sensitive to changes in policy rates. He added that corporate credits are not responsive to alteration in policy rates. On the other hand, Khediri, Casu and Rahim (2005) specified that bank lending policies determines the level of charged premium for customers and also they added that different factors play important role in determining charged premium. These factors are: diversity of customers, types of contracts, volume of deposits and loans, level of risk and management, and availability of collateral with size of the collateral.

2.2.2 Importance of Interest Rate Spread

In every economy, IRS is used as leading economic indicator, because IRS changing before economy changes. Boldbaatar (2006) specifies that when interest rate level changes these changes also affect the level of IRS. If interest rate levels are high, on the other side, IRS level is also high. Hence, this situations increase the level of risk in banking system. Khawaja and Din (2007) added that when the level of interest rate spread increases this situation dissuade investors from making savings and investments. They also fear about the efficiency of bank lending channels.

2.2.3 Effects of financial crises on Interest Rate Spread

In recent years, finance world had been facing with two big financial crises. One of them was in 1998 known as Asian Financial Crisis and the other in year 2008 referred as Global Financial Crisis. Asian financial crisis created high and volatile IRSs and country spreads. Brock and Franken (2002) founded that alterations in banking regulations and Asian financial crises have affected bank interest rate spreads in Chile. Bekaert et al. (2004) specified that after financial crisis if policy reforms were grouped together, they argued that before the reforms the effects of crisis were in negative direction. On the other hand, the same source stated that those

countries which have sufficient Bureaucratic Quality, they could easily cover the negative effects of the crisis.

2.2.4 Types of risks in Interest Rate Spread

There are two types of risk with interest rates. First one is systematic risk and the other one is non-systematic risk. Systematic risks are macroeconomic risks. Macroeconomic risks linked with general economic conditions. Macroeconomic risks examples are fluctuations in currency or inflation in the economy. Because of inflation, level of prices goes up, thus everybody pay more money to buy goods and services. Whether money supply increases in the economy or not, value of the currency decreases. Also fluctuations in currency influence the effectiveness of the economy, if interest rates become higher, purchasing power decreases. Brock and Franken (2003) and Chirwa and Mlachila (2004) stated that macroeconomic factors are the most important determinant for changes in interest rate spreads.

On the other hand, non-systematic risk covers credit risks. This is more related with the borrowers' side such as good credit or bad credit and maturity risks. Boldbaatar (2006) found that changes in the market interest rate create another two types of risks; first one is reinvestment risk and second one is refinancing risk. Refinancing risk arise if market rate increases, reinvestment risk arise with if market rate diminishes. Credits financed from the market are connected with refinancing risk and deposits invested in the market are connected with reinvestment risk.

2.2.5 Determinants, Causes and Factors of Interest Rate Spread

There are many reasons for high IRSs. These reasons vary from country to country. Sometimes macroeconomic policies are the main cause for high IRS. On the other

hand, literature also indicates that the effect of government policies and political conflicts are main reason for high interest rate spreads.

Generally researchers divide the determinants of interest rate spread into 3 sub-group; macroeconomic factors, bank specific factors and regulatory factors. Were and Wabua (2013) notify the determinative factors of the interest rate spread and divide them into three categories ; macroeconomic factors, bank specific factors and banking system factors. Macroeconomic factors are inflation rate and growth rate; bank specific factors are administrative expenses, liquidity ratios, bank sizes, non-performing loans (NPL) and revenues; banking system factors are reserve requirement, level of competition and concentration of the banking sector. In addition to this, Boldbaatar (2006) specifies that concentration of the banking sector calculated by sum of market shares of biggest three banks in Total Asset of banking system.

According to Jayaraman and Sharma (2005) in year 1999, Committee of Inquiry into Financial Services set up by Government of Fiji; have listed reasons for high IRS:
- Absence of sufficient level of competition,
-Diseconomies of scale due to small size of markets,
-High level of operating and fixed costs,
-Lack of regulatory control,
-Perceived market risk and high level of risky environment,

These factors affect intermediation costs negatively so costs of intermediation increases therefore spreads widens. This means that burden on the shoulder of the

creditors' increases, on the other side, profit margin of depositors' decreases. Thus, they lose money from this problem.

On the other side, Jayaraman and Rajesh (2005) states that in Fiji lack of investment attempt, deficiency and lack of credible projects and extra volume of liquidity has been identified to responsible for high IRS. In non-developing countries, in the lack of stock market and also secondary market, the investors put their savings into the banks as deposits or hide savings in their money cases.

Ganga (1998) stated the Sources of Spreads and categorized them into two parts:

Factors Adding to Spread

- Administrative Cost: includes wages and salaries, housekeeping costs also involves computerization. Formula is (Administrative cost / Total Loans).

- Required Reserves: Statutory reserves deposits and mandatory reserves.

- Tax Payment: Direct taxes affect spread positively. Formula is (Tax payment / Total Loans).

- Accounting Tax Profit Margin: Refers to after tax profit and formula is (Profit Margin / Total Loans).

- Loan Loss Provisioning: Adequate level is necessary since current recessionary conditions have been result an increase in NPL. Formula is (Provision inflation for classified claim / Total loans).

Factors decreasing the spread:

- Remuneration on Reserves: Reserves created from profit like retained earnings .This reserves used for later to pay bonuses. (Remuneration Received from RBF / Total Loans)

- Other Sources of Income: Income derived by banks from other sources. These sources are non-interest income derived mainly through fees and charges. (Non-Interest Income / Total Loans)

2.2.5.1 Reserve Requirements and IRS

Reserve Requirements are important for Central Banks (CB), because of liquidity management and capital adequacy. According to Folawewo (2008) reserve requirements are primary decisive of IRS. For residual imbalances we use reserve requirements. A lot of studies show that there is positive correlation between reserve requirements and IRS. Also we must know that if banks allocate reserve requirement who inherited to legal statutory, this reserve requirements increases the loan interest rates.

2.2.5.1.1 Purpose of CBs

After global crisis period, CBs try to ensure stability of the economy with the help of reserve requirements. According to Alper and Tiryaki (2011) within the framework of inflation targeting regime the effect of reserve requirements works with the help of cost and liquidity channels. Basically, working through with the hand of central bank, CBs regulate and control credit market through short term interest rates. CBs change the reserve requirements, hence this changing affect the spread between loan and deposit rate of bank. On the other hand, liquidity channel works with banks short term needs of resources from CBs. This requirement influence lending behavior of the banks. Central problem is reserve requirement changes; these changes affect cost liability of the bank.

2.2.5.1.2 Reaction of Financial Institutions

Banks try to adjust spread between deposit and loan interest to compensate or minimize reserve requirements changes affect, because effect of the reserve

requirement is directly correlates to the structure of financial sector. (Khawaja and Din, 2007) added that when CBs changes the yield level of treasury bill, thus this change affects the spread and creates impression on cost of capital, then changes the level of investment and consumption decisions.

Vera et al. (2007) specify that interest rate of deposits determined by external variables, these external variables arise in two conditions; one of them is in the event of when banks combat with depositor funds and the other one is when monetary authority determines the interest rate on deposits. Reinhart (1999) pointed out that if countries financial intermediaries offer alternative services against bank deposits, interest rates on deposits less affected by change in reserve requirements. In the case of existing access for non-credit financing, this time loan interest rates are less affected by the change of reserve requirement.

In banking world, banks do not adjust their long term interest rates continuously; they adjust only short term interest rates, because banks earn money from short term lending interests. On the other hand, many banks offer higher deposit rates in the terms of short term deposits for the purpose of catch depositors to save their money in the bank; banks make money and profit from these depositors, also invest depositors' deposits into their investments.

2.2.5.2 Liquidity of the Banks and IRS

Koyuncu (2010) said that "liquidity significantly affects bank spreads. Domestic banks hold a high proportion of their assets in the form of liquid assets seem to charge higher spreads and transfer opportunity cost of holding liquid asset to borrowers" (p. 70). Nowadays liquidity managed by open market operations. In contrast, Khawaja and Din (2007) stated that there is positive correlation between

IRS and liquidity of the banks, when the liquidity level of the financial intermediaries raises banks desire for deposits diminishes, thus banks decrease the level of deposit interest rates and the level of spread widens.

2.2.5.3 Economic Periods and IRS

Uribe and Yue (2003) founded that economic expansion or boom period connected with low level of interest rates periods, on the other hand, the recessionary or depression periods connected with high level of interest rates periods and added that rise in world interest rate increases the level of country spreads. On the other aspect (Boldbaatar, 2006) argued that in the periods of economic expansion, banks be exposed with high level of loan demand, this conditions give the chance banks for earning surplus margin and surplus profit. At the time of contractionary monetary policy periods, size of the commercial bank lending diminishes; therefore commercial banks solve the problem with the help of increasing the level of agency costs or intermediary costs (Gertler et al., 1990).

Brock and Suarez (2000) specified that any economic shock that finalized with expanded spread will raise loan rate more than deposit rate. This theory confirmed by Mugizi et al. (2011) their studies suggest that movement of the IRS was affected by more loan rate than deposit rate of interest.

In contrast, Were and Wabua (2013) stated that inflation rates and raise in real Gross Domestic Product (GDP) negatively correlates with deposit interest rates, because when economy goes into boom period, this period raises up the demand for deposits but this time banking institutions do not want to raise deposit interest rates level. On the other hand, (Hossain, 2010) time series data show that IRS is sensitive to deposit, meaning that spread rates are not sensitive to credit rates, this indicates that any

change in spread affect the deposit rates more than lending rates and also remind that ceiling on loan rate works in short run period, not in long run .

2.2.5.4 Operating Costs and IRS

In many developing or non-developing countries main reason of high operating costs is lack of competition, if countries have restrictions in competition in these circumstances there is no any power behind from deposit rates and interest rates to push them upward or downward directions. Jayaraman and Rajesh (2005) said that the primary reason for high IRS in Pacific Island Countries and Fiji has been found to be deficiencies and weaknesses in their financial sectors, also the existence of high intermediation costs. In weak financial sectors, the intermediation costs are much larger than strength financial sectors, thus this costs are responsible from high spreads in IRS. Turtelboom (1991) specified that transaction costs or intermediation costs such as administrative expenses and default costs are main determinant of IRS. Also he gives an example of transaction costs of industrialized countries lower than from developing countries. Ngugi (2001) stated that "For pre-liberalization period the minimum and maximum ceilings on deposit and lending rates set a maximum IRS. During post liberalizing Kenya's experience indicates a widening spread because of yet-to-be gained efficiency and high intermediation costs".

2.2.5.5 Market Power and IRS

In literature, many empirical studies showed that when position of the banks in the financial system becomes oligopolistic, increase in the interest rate on loans more than interest rate on deposits and also we know that when economic levels goes bad, banks do not reflect changes on credit rates, but they reflect to changes on deposit rate. Brock and Suarez (2000) argued that less efficient banks work with lower IRS, because of two reasons; these reasons are they tend to give lower loan rates and high

deposit rates, because they want to get higher market share and on the other hand because of loan losses provisioning by these banks noticed spreads to diminishes. According to Hossain (2010) if countries have underdeveloped equity markets, in these circumstances banks get strong position in the banking system and they do not want to reduce IRS, keep them in high levels. At the same time more diversified banks have higher market power, because these financial intermediaries capture the banking sector through the channel of variations in their financial instruments.

In developing countries, there is not another alternative for financial institutions and some banks market power is oligopolistic. According to Boldbaatar (2006) big banks or dominant banks perceived as `too large to fail`, this means that big bank reputation is very high and customers trust to dominant bank is very high, in these circumstances we understand that dominant bank customers agreed to low level of deposit rates because of reputation or name. And this oligopolistic system gives advantage and monopolistic power to the bank.

2.2.5.5.1 Merger and Acquisitions

In financial literature, financial institutions gain advantage from merger and acquisitions, these advantages for investors are; rises in the monopolistic power, increase the level of economic efficiency, improve the level of financial instruments and expand the level of their scope. Boldbaatar (2006) specified that consolidation by courtesy of mergers and acquisitions can give as a gift to financial institutions with high level of IRS, so these spreads improve the profitability of financial intermediaries. Merger and acquisitions abolish weak and small banks from the financial system, so big banks spring up and dominate the financial market, when banks dominate the financial market depositors accept low level of deposit rates.

This means that dominant banks control the market and set the level of loan interest rates and deposit interest rates, thus spread becomes widened and general sentiment of the market affected from this situation and other banks set the level of spreads according to dominant banks and also the level of concentration in financial system increases, therefore in the time of high concentration, the level of competition diminishes. In contrast, Woodbridge and Williams (2003) states that there is Antitrust Policy in Australia and this policy is useful to limit the market power in the time of monopolistic problems, these policy is very effective if countries have privatized and deregulated public utilities.

2.2.5.6 Economic Growth and IRS

It is well known that investment is the key factor for economic growth. Investments are divided into two; public investment and private investment. Beddies (1999) study showed that private investment has a stronger, more favorable effect on growth rather than government investment. This is probably because private investment is more efficient and less closely associated with corruption. Private investments made by venture capital firms and private equity firms. These investors have own mission, strategies, research & development and expansion policies. Also we have different investment strategies. These are growth capital, venture capital and leveraged buyouts.

On the other hand, when we look at other side public investments made by governments and must secure the future framework of welfare society such as; investment in building, education and research. In his other study in the year of 2001, Jayaraman and Rajesh (2005) stated that government applied Non-Tax Territory in

order to attract new investments into the economy, thus this movement enhance the volume of investments in the economy.

Alvarez (2007) found that Taiwan and Chile starts with a high IRS in 1988 but when we come to 2007 spreads decreases to 1.83% and 2.68%. He specified that IRS is dependent variable and macroeconomic factors such as export volume, exchange rate, money supply and inflation are independent variables. In Chile case IRS is affected by export, money supply and inflation so this means that there is positive relationship between IRS and economic growth. Reason that could be advance for this may have been that despite the high lending rate charged by financial institution, they buy loan thus increasing economic growth and there is also positive relationship with IRS and inflation.

Low rate of inflation and appropriate pricing of capital, labor and land to maintain international competitiveness are two main macroeconomic challenges for decision makers to make the country investor friendly (World Bank 1995). If inflation rate is high, this situation decreases the demand of the investors to make investment. Because of inflation negative effects, they do not have appropriate pricing of capital strategies. Also, higher level of inflation diminishes the ability of private sectors to carry out their designated program. On the other hand, sometimes our investment levels diminish, the user cost of capital is increased by raising the cost of bank credit. We know that interest rates have negative relationship with investment. If interest rates increase, investment decreases. Negative interest rates discourage saving, saving decreases, this means that investment diminishes. Uribe and Yue (2003) founded that change in the country spreads highly correlated with 60% of country spread shocks.

In many countries and many studies, researchers attend to use survey techniques to understand the problems easily and get their answers with the help of these interactions. They try to generate survey questions related to topic and communicate in the survey area.

In addition to this, Duncan et al. (1999) stated that any lack of profitable business opportunities can be traced to three causes; first one is increase in the cost of investing because of government policies. Second one is cultural and social barriers. And the last one is natural barriers such as physical and scale location. Also, Bakare (2011) founded that four major variables hamper domestic investment in Nigeria. These impediments are; corruption, macro-economic instability, political instability and poor infrastructure.

According to these empirical results we understand that public and private investments are not complementary, if countries want to reform private sector they must improve all components. These components are; the inflation rate, the lending rate, the deposit rate and the real exchange rate.

2.2.5.7 Efficiency of Legal Structure and IRS

In developing countries, there is a problem in the efficiency of the legal structural frame, so this situation have negative effects on IRS, if countries have deficiency in their legal institutions this reflect to their credit rates in the form of charged premium, also IRSs affected negatively in times of economic crisis. In Indonesia and Mongolia reason for high IRS is considerable amount of legal risks, in contrast, in Malaysia high level of government interference is not reason for high spreads (Boldbaatar, 2006). On the other hand, if countries legal structure level is strong, this situation positively effects on IRS. Banking system improvement and structural

development calculated by using Two Capital GDP. Both of these variables negatively correlated with interest rate spread.

2.2.5.8 Non-Performing Loans and IRS

Variations in the IRS, banks try to protect profit margins. For example banks face with higher credit risks as the proportion of NPL and answer with charging high lending rates; higher credit risk means that higher risk of creditor default, if credit risk level increases management of the financial institution must improve or reform their management system.

2.2.5.9 Inflation Level and IRS

In countries with high inflationary pressure, banks increase lending rates but were reluctant to reduce when Treasury bill rates come down this time income from loans decreases, they respond with reducing deposit rates.

2.2.5.10 Taxes and IRS

According to Mugizi et al. (2011) they divide commercial bank taxes into two parts like explicit taxes and implicit taxes; explicit taxes are stamp duties, license fees, value added taxes and withholding taxes, on the other side, implicit taxes are indirect cost that results from a government policy, these taxes are derived from governmental regulations, well known example of implicit taxes are reserve requirements. Also performance in the loan market reflects to macroeconomic environment and high implicit taxes (required reserves) increase the spread between loan and deposit rates.

2.3 Effect of Financial Liberalization on Interest Rate Spreads

In this section, we try to look at the liberalization in terms of IRS. Liberalizing banking system includes following characteristics; adopt their loan interest rates & deposit interest rates market oriented, decrease the level of reserve requirement up to

necessary for stability of financial system and eliminate the mandated allocation of credit certain sectors (Roland, 2006).

Foreign investors do not prefer to make an investment in non-developed countries, because they know that these countries do not have efficient legal system in their legal environment. Therefore foreign investors fear to make investment. First of all, we divide liberalization in 3 parts. These parts include; Pre-Liberalization Period, Liberalization Period and Post-Liberalization Period. Every level of the liberalization had different effects on countries' economies. Also every period had different advantages and disadvantages. So we try to give information about the different aspects of periods to show the level of economy from past to the future.

2.3.1 Pre-Liberalization Period and IRS

In 1980s, International Monetary Fund (IMF) tried to help some African countries, the effect of interest rate liberalization on IRS was negative, and moreover the interest rate of lending rises and the interest rate of deposits decreases, thus IRS expanded (Turtelboom, 1991).

In developing countries, governments give more sovereignty to CBs, thus this situation finalized with the "financial repression". Financial repression is an important for development of countries, pre-liberalization period defined by financial repression term. Roland (2006) specifies that `financial repression has adverse effects on the quality and quantity of investments in an economy because it crowds out high-yielding investments and discourages savings. Before the financial liberalization economies have interest rate ceilings, direct credit controls and reserve requirements are very high in every developing country.

Ngugi (2001) added that in this period governments have fixed IRSs and government of the Kenya constructed Deposit Protection Fund in order to increase the stability of the financial system. Also new banks did not enter into the financial system. Turtelboom (1991) show that macroeconomic instability and rise in the level of commercial banks NPL in the period between ends of 1970s and begin of 1980s destroy the market of long term deposits and credits.

In this period, IRS was high, because the level of operating costs and NPL were very high. Financial institutions do not have any alternative to diversify their risk, then this risk come out an expense for loan creditors. Many studies show that high level of operating costs increase the level of IRS. Brock and Suarez (2000) clarify that in 1980s, "macroeconomic mismanagement in the context of repressed financial systems resulted in period of hyper-inflation and a drastic loss of real wealth for depositors" (p. 118). Bekaert, Harvey and Lundblad (2004) put the last point and said that "never liberalized countries have: lower secondary school enrollment, lower life expectancy and higher population growth" (p. 4).

2.3.2 Financial Liberalization Period and IRS

Liberalization starts with eliminating the effects of deposit interest rate and loan interest rate ceilings. Because interest rate and loan rate ceilings create a monopolistic financial institution. This situation finalized with inefficient banking system, if we have deficiency in financial system IRS levels expand. For example in India (Roland, 2006) deposit rate liberalization begins with establishing maximum rate for term deposits.

 In Tanzania (Mugizi, Ndanshau and Aikeli, 2011) year of 1991 government of Tanzania eliminate the restrictions to free entry. Bekaert et al. (2004) said that

financial liberalization includes three types of reforms and regulations; these reforms are legal reforms, financial reforms and macroeconomic reforms; legal reforms are improvement of legal environment and investor protection also corporate governance; financial reforms are reforms in equity market like open stock exchange trading activity and develop the size of banking system; macroeconomic reforms are the black market foreign exchange premium, trade openness and level of inflation.

In every economy in the world, when countries entered into liberalization period they hope that this period had positively effect on their economy, they hope that financial liberalization raises the competition so financial sector becomes efficient. In developing countries when they accept new entry into their banking system, this improvement give chance to banking institutions for set up new bank operations and help the country's for banking system development.

Liberalization help to raise the number of insurance companies and commercial banks, also this improvement increase the variety of new financial instruments. Bekaert et al. (2004) founded that equity market liberalizations raises the level of economic growth by 1 %, they specify that equity market liberalizations shrinks down financing limitations, for example, foreign investors invest in domestic equity securities and demand better corporate governance for development of banking sector so this situation reduces the costs of finance. Foreign capital availability becomes superior levels thus cost of capital decreases.

In every country in the world tries to raise the regulation of their financial systems thus CBs became a main determinative of setting up new regulations. Nampewo (2012) said that Uganda started to financial liberalization in the 1990s, thus this

statement improves the efficiency of the financial system also this would be reflected in the diminution of IRSs. This situation exposes that liberalization negative correlation with interest rate spreads, because financial liberalization leads to increase in financial development.

In contrast at Latin America, Vera et al. (2007) specify that in the time of pre-liberalization spreads remained at low levels, but after financial liberalization the level of spreads increases. They argued that this arises because of high level of interest on loans rather than deposits.

In a financially liberalized system (Brock and Suarez, 2000) noted that banks get an important role, in additionally IRSs and interest rates support a signal for importance of banks place in financial system.

2.3.3 Post-Liberalization Period and IRS

Following procedures make banking system more profitable, more efficient and well capitalized. (Nampewo, 2012) explicit that especially sufficient reforms in financial system, recovery or purify of weak banks, use of risk centered management and development of bank regulation & supervision , squeezed credit classification and finally ensuring all of the standards generates more efficient financial system .

In contrast, Ngugi (2001) said that reason for high spreads in Kenya were enhanced level of intermediation costs and inefficiency in financial market, also Were and Wabua (2013) contributed that despite the financial liberalization especially after post liberalization period in some African countries like Kenya high IRSs constitutes a problem, therefore this result show us that the effect of liberalization is not identical in every country and also in Bangladesh same problem emerges (Hossain,

2010) because of this problem Bangladesh Bank applied interest rate control policy to Bangladesh banking sector.

Bekaert et al. (2004) founded that in post-liberalization period the level of real annual GDP growth rate is 1% bigger than pre-liberalization period and they specified that there is a bigger difference in the growth rates of liberalized and non-liberalized countries also they noted that this difference is like 2.2 percentage.

Uribe and Yue (2003) outlined the disadvantage of the liberalization in the time of post-liberalization period, they discover that United States interest rate shocks negatively correlates with country spreads and added that the effect of United States interest rate shocks are about 20 % on countries economic system. Bahattarai, Lee and Park (2013) added that in European area when countries enter into currency union, their level of IRS start to going up such as Greece and Portugal.

IRS diminishes with the channel of diversification such as risk diversification. Banking intermediaries decreases cost of borrowing with the help of risk diversification so interest rate on loans decreases. Afful and Afiedu (2013) states that in the mid-2000s, developing agencies like IMF provided the development of capital markets, IMF try to improve domestic resource mobilizations, provide the use of available assets and increase the supply of long term capitals.

Finally, Bekaert et al. (2004) specified that if countries have big work power and perfect financial markets, they become successful in liberalization.

2.4 Measurement of Interest Rate Spread

Jayaraman and Rajesh (2005) The Committee of Inquiry into Financial Service (1999) in its report submitted to Fiji Parliament adopted the following procedure to measure the IRS:

IRS = Interest earned from loans / Average Interest earning assets - Interest paid out to deposits / Average total deposits.

In this formula, NPL and all deposits are measured. The figure gives an accurate picture of the performance of banks' lending portfolio as well as the true average cost of funds. Boldbaatar (2006) specified that IMF offers the formulae such as calculate both ex-ante spread and ex-post spread when calculating the loans and deposits of the banking system.

Brock and Franken (2002) compare net interest margins with IRSs and they state that there are two definitions of interest margin. First definition is gross margin and second definition is net margin. Gross margin calculate by subtracting total interest expenses (including commissions) from total interest income and dividing them to total earning assets. On the other hand, net interest margin is calculated by similar approach but except commissions.

2.4.1 Ex-ante Spread and Ex-post Spread

For the analysis of strong and efficient banking system we have two types of spreads. First type is ex-ante spread. Second type is ex-post spread. According to Demirguc and Huizinga (1998) and Boldbaatar (2006) ex-ante spread is derived by contractual rates charged on credits and paid for deposits. On the other hand, ex-post spread calculated with the help of interest expenses and interest revenues. We take

difference of both parts. Boldbaatar (2006) stated that if the interest rates of deposits and credits approximated from financial system items, researchers should use ex-post spread because they can be aware from the risks of past contracts. At the same time, Beck (2000) added that use of ex-post spread gives chance to bring out the determinants of Net Interest Margin (NIM) in more comprehensive scope and also determine the net impacts on shareholders.

2.4.2 Alternative Proxies for IRS

According to Brock and Suarez (2000), there are six alternative proxies for bank spreads. Banks in most countries calculate spreads with the help of NIM. But this method does not includes income revenues and bank charges like commission and fees also add that there is another problem, by the inclusion of all interest earning assets and liabilities, NIM occurs with marginal spread that mirrors the bank's revenues and costs, this situation especially acceptable in countries where banks hold low-yielding bonds and non-interest bearing reserves.

In the light of explanations, researchers said that there is no simple route for spread measurement so they try to generate proxies. These proxies are; (n=narrow definition, w= wide definition). Narrow definition consists of loans in the assets part and deposits in the liabilities part. On the other hand, wide definition consists of all interest earning assets, liabilities and also associates commissions and fees. They are:

1- $1n$ = (interest received / loans) – (interest paid / deposits);

2- $1w$ = (interest received /all interest-bearing assets) – (interest paid / all interest-bearing liabilities);

3- $2n$ = (interest + commissions received / loans) – (interest paid + commission paid / deposits);

4- 2w = (interest + commissions received / all interest-bearing assets) − (interest + commissions paid / all interest-bearing liabilities);

5- 3n = (interest received on loans only / loans) − (interest paid on deposits only / deposits);

6- 4w = (interest received − interest paid) / (Total Assets)

Naturally, different proxies would give different results. Khediri et al. (2005) outlined that profitable banks are statistically significant at same level, on the other hand, low level of profitable banks in relation with high level of credit risk, opportunity cost and operating cost.

In different types of studies, researchers use different proxies, so they obtain different outcomes. This means that different measurement techniques give us different results, also different policy implications. Because of this reason researchers and analysts must be careful in the use of measurement techniques and identify sample data perfectly. Crowley (2007) gives the example of Financial Sector Assessment Program report for Kenya, these report exposed different variations in IRS results and he said that spread changes from 7% to 20%. On the other hand, according to Boldbaatar (2006) the other way of calculate the IRS is studying of NIM and also adds that variations in the NIM give shape to variations in interest rate spread. Demirguc and Kunt (1998) sources of higher NIM are inflation level, operating costs, and higher level of interest, foreign ownership, leverage and higher capitalization; on the other hand, sources of lower NIM are depositors' funding and high level non-interest earning assets. Crowley (2007) specified that NIM conquers the effects of lending in different types of variations. Khediri et al. (2005) used micro model and dealership approach model for identifying bank NIM, also added that

these models help to find bank risk aversion, mean size of deposit and credit operations, opportunity cost, changes and volatility in Money Market (MM) interest rates, market structure, equity capital.

2.5 Consequences of High Interest Rate Spread

From a depositors' perspective an increase in IRS means that banks try to maximize its profits. Therefore depositors fear about raising fees and charge rates on banking activities, because they would pay more than before. Thus this situation demoralizes the moral of the depositors and creditors.

Boldbaatar (2006) indicates that there is no any available fund for meets the credit demanded; on the other side, there is no any available loan demand in the time new deposits supplied, therefore banks try to interplay with MM, this interplay includes market risk, banks reverse the risk with the help of IRS, give low deposit rates and high loan rate.

Romero and Rodriguez (2011) stated that because of high IRSs financial institutions dedicate more of their deposits to accommodate these requirements, so they try to diminish the costs through prices and developed the level of income.

Below we develop a table with the help of World Bank (2014). This table gives a comparative picture of magnitudes of IRS in some developed countries and developing countries. In the light of table, we see that the levels of IRS for developed countries are very low, but developing countries it is found to be high.

Table 2.1: Banks Interest Rate Spreads in selected Countries

Country Names	IRS in Selected Years			
	2009	2010	2011	2012
Developed Countries				
Canada	2.5%	2.4%	2.5%	2.5%
Japan	1.3%	1.1%	1.0%	0.9%
New Zealand	2.6%	1.7%	1.8%	1.7%
Switzerland	2.7%	2.7%	2.7%	2.7%
Developing Countries				
Armenia	10.1%	10.3%	8.5%	7.7%
Costa Rica	12.8%	11.8%	12.1%	13.5%
Kosovo	10.1%	10.9%	10.2%	9.1%
Peru	18.2%	17.4%	16.3%	16.8%

Source: World Bank (2014)

Search shows us that high spreads are barrier to expansion and development of financial intermediation. There is strong argument that high level of IRS affects negatively economic growth and development of non-developed countries.

In today's economic world, every part of the economy is affected by negatively or positively because of the high level of spreads. Chirwa and Mlachila (2004) specifies that high spreads attributed as high monopoly power, high reserve requirements, high inflation and high CB discount rates.

Higher level of IRS means that countries have high level of concentration in banking system, moreover high level concentration ratio positively correlated with high level of spreads between deposit and loan interest rates. Also, Crowley (2007) notifies that if size of a banking sector or size of the economy is small, level of concentration ratio would be bigger and higher.

2.6 Examples of Empirical Studies

In literature, there are many examples of empirical studies and articles related with IRS. At the below, there is many different examples of empirical studies from all over the world.

For Eastern Caribbean, Randall (1998) used time series and cross section estimates for each country (Antigua& Barbuda, Dominica, Grenada, St. Kitts & Nevis, St. Lucia and St. Vincent & Grenades) and pooled them in panel data set from 1991 to 1996. Because of limited number of observations and also for reliable testing either fixed effect or random effect models used for each country.

For Chile, Brock and Franken (2002) compared interest margins (both gross and net) with IRS cover the period of 1994-2001. They analyze the results with dividing them into 5 group (Bank Characteristics, Aggregate Risk, Industry Structures, Policy Issues and Dummy Variables) and used panel data estimation with fixed effect model.

For 6 SEACEN Countries (Korea, Malaysia, Mongolia, Philippines, Sri Lanka, Taiwan) Boldbaatar (2006) analysis was performed by using panel data method and cross-section with 40 banks and the model based on Dealership Model (Ho and Saunders, 1981). Sample period from 4th quarter of 1998 to 2004. In IRS measurement, because of data limitation ex-post rates used, in addition to these, two different approaches conducted like micro for each individual bank and macro for overall spread of system.

Vera et al. (2007) examined the determinants of high IRS in Venezuela. They use Balance Sheet and Income Statement items to calculate NIM with ex-post spread. Spreads empirically explained by two-step procedure. They used also Dealership model and define that NIM is function of risk and factors in system (Ho and Saunders, 1981). Database set up for periods from 1986 to first half of 2000.

For Eastern Caribbean Currency Union, Grenade (2007) used panel data technique with fixed effects pooled regressions in determining IRS for period 1993 to 2003. In calculating IRS ex-post rates used. All estimations done by using Two-stage least square to account endogeneity, also Seemingly Unrelated Regressions method used for correcting both cross section contemporaneous correlations and heteroscedasticity.

Khawaja and Din (2007) performed different type of foreign participation model of (Peria and Moody, 2004) to specify the determinants of IRS in Pakistan. For this purpose, panel data estimation method for 29 banks in the period of 1998-2005 investigated. In addition to this, common effect model and Feasible Generalized Least Squares method used for model estimation. Also HHI (Herfindahl-Hirschman Index) measure the concentration ratio in this study.

For Bangladesh, Hossain (2010) analyzed IRS and margins for the period of 1990 to 2008. Arellano-Bover / Blundell-Bond dynamic panel regression model used for application of 43 banks. HHI used for determining market structure and concentration. For understanding long term behavior of IRS, Vector Auto Regression and Granger Causality tests performed.

Mugizi et al. (2011) studied to find the determinants of high Interest Rate Spreads in Tanzania. They used secondary quarterly time series data for the period 1991 to 2009. All data of the study gathered from Bank of Tanzania. Also Ordinary Least Square method used to estimate equation and Engle-Grenger two- step procedure for co-integration.

In the case of Pakistan, Siddiqui (2011) examine the determinants of IRS with panel data models for the period of 2000 to 2008. He used ex-post spread to determine IRS. In panel data, Hausman test performed for supporting fixed effect model to selecting between random or fixed effect models in estimation.

For Uganda, Nampewo (2012) investigated to determine the reason of high IRS between the periods of 1995 to 2010. Ex-ante rates used for calculate IRS. Two-step procedure of Engle-Grenger Approach (1987) and EViews 3.1 used for co-integration.

Shahzad et al. (2012) found the determinants of IRS in Pakistan with the channel of adding technology as a key factor. They used Hypotheses Statement to find which factor has important impact on IRS, also perform cross section Ordinary Least Squares (OLS) and fixed effect with cross section weight.

Were and Wambua (2013) assessing the determinants of IRS in Kenya. For empirical analysis, they use panel data method covering period from 2002 to 2011. In panel data method; they used both fixed and random effects models. At the same time, market concentration ratio HHI used for testing suitability of fixed effect models over random effects model.

For Sub-Saharan Africa (Botswana, Ghana, Mauritius and South Africa), Afful and Asiedu (2013) study to determine the influence of stock market activity and fiscal policy on IRS from period 1998 to 2010. Study stated Hypotheses Statement and analyzed their data separately and pooled. For Auto-Correlation problem, they conducted Unit Root Tests with the help of Augmented Dickey Fuller (ADF) process. Also, they performed OLS method for analysis.

Bektas (2014) investigated to find out the determinants of NIM and IRS, then compare them to detect whether they have same or different determinants in the case of North Cyprus. For this purpose, panel data estimation method used for 24 commercial banks in the period of 2003-2009. On the other hand, dealership model developed by Angbazo (1997) and single-step regression approach helped to find out determinants. In addition to this, two unique spread measures introduced named as micro and macro.

2.7 Summary of Literature Review on IRS

1) IRS divided into two parts; deposit rate and loan interest rate. IRS is the gap between credit (loan) rates and deposit rates. Many researchers find evidence that IRS is a problem in many countries. Researchers try to investigate literature and then use measurement technique which are suitable for making empirical analysis with the help of data availability.

2) There is positive correlation between IRS and profitability of the banks. Studies show that developing countries suffered from IRS. Upward trend for IRS indicates that either borrower or depositor side of IRS is affected negatively from changing

trend. Bank lending policies determine the level of charged premium and the level of IRS.

3) In interest rates there are two types of risk, first one is systematic risk like macroeconomic risk and the other one is non-systematic risk like credit risk. Macroeconomic risks linked with general economic conditions such as inflation in the economy. Macroeconomic risks are main determinant for changes in IRS.

4) In every economy, IRS is used as one of the leading economic indicators. CBs try to ensure the stability of the economy with the channel of Reserve Requirements. CBs are most important financial institutions of all economies but the level of independence changes country to country. CBs regulate and control market through short term interest rates and change Reserve Requirements, so this changing affects the level of IRS. Also banks continuously adjust only their short term interest rates, because banks earn more money from short term lending interests.

5) Change of the IRS has been affected by more loan rate of interest than deposit rate of interest. On the other hand, inflation rates and raise in real GDP negatively correlates with deposit interest rates. In boom periods, the level of interest rate is low but depression periods connected with high level of interest rates. Also country interest rates affected from world interest rates.

6) Every level of the liberalization had different effects on countries' economies. Liberalization has been studied in 3 periods. First one is pre-liberalization period. Economies had interest rate ceilings, direct credit controls and reserve requirements were very high. In financial liberalization period, countries eliminated the effects of

interest rate ceilings and also this period increases the competition with banking system development. In post-liberalization period, IRS diminishes with the channel of risk diversification.

7) Countries with high IRS rate are correlated negatively with institutional efficiency of the banking sector. If countries want to reform private sector they must improve all components like inflation, lending, deposit and real exchange rate.

8) There are many reasons for high IRS and these reasons vary from country to country; macroeconomic policies, effect of government policies, political conflicts, diseconomies of scale due to small size of markets, effects of dominant banks, lack of equity markets, high level CB discount rates, high level of concentration in banking system, high intermediation costs, tax payment, Loan Loss Provisioning and high level of credit risks.

9) Basic IRS formula = IRS (Interest Rate Spread) = Interest earned from loans / Average interest earning assets   -   Interest paid out to depositors / Average total deposits.

Chapter 3

DATA AND METHODOLOGY

3.1 Introduction

This section will initially outline the data which will be used for the empirical work. The section will also provide some information about banking industry of North Cyprus. In addition to this, the method will be introduced in this section of the study.

3.2 Overview of North Cyprus

In this part, we try to briefly give some information about North Cyprus economy and specifically on banking sector situation.

3.2.1 Economy of North Cyprus

The economy of the North Cyprus is dominated by the services sector which includes tourism, public sector, trade and higher education. The official currency of Turkish Republic of Northern Cyprus (TRNC) is Turkish Lira (TL). According to bulletin of TRNC CB (2015), Gross Domestic Product (GDP) of North Cyprus is 8.858 (million TL). The same source indicates that GDP per capital is 15.109 US $ (dollar). On other hand, North Cyprus export volume is 134 (million $) and import volume is 1,784 (million $). This values shows that the economy of the North Cyprus is an import based economy. One of the reasons of high trade deficit is due to political conflicts and embargos on to the North Cyprus economy.

3.2.2 Financial System of North Cyprus

When we examined finance system of North Cyprus, we find that banking sector generates 90 % of the system. According to third quarter bulletin of TRNC CB

(2015), there are 22 licensed banks operating under banking law of North Cyprus. These commercial banks are classified state banks (2), private local banks (13) and foreign branch banks (7). The total number of bank branches is 221.

Table 3.1: Consolidated Balance Sheet of Banking Sector (Million TL)

	2010	2011	2012	2013	2014	2015 Q3
Liquid Assets	2.493,8	2.415,1	2.957,3	3.463,2	3.310,5	3.879,7
Securities Portfolio	500,2	965,5	560,1	416,6	890,9	1.033,9
Loans (Gross)	4.630,7	5.868,5	6.778,1	8.405,8	9.557,9	10.891,5
Other Loans	792,1	668,7	730,0	1.069,7	1.076,8	1.492,8
Total Asset-Liability	8.416,8	9.917,8	11.025,5	13.355,3	14.836,1	17.297,9
Deposit	6.842,8	8.087,9	8.973,8	10.685,1	11.773,9	14.007,8
Payables to Banks	224,1	315,0	310,3	638,5	799,4	867,4
Other Liabilities	414,4	417,9	538,2	670,4	759,1	832,1
Total Equity	935,5	1.097,0	1.203,2	1.361,3	1.503,7	1.590,6

Source: CB of TRNC (2015)

3.2.2.1 Consolidated Balance Sheet of the Banking Sector

Firstly, total assets of the banking sector was 14.836,1 (million TL) in year 2014, but this ratio in 2015 third quarter increased to 17.297,9 (million TL). Secondly, the level of total credits was 9.557,9 (million TL) in year 2014, but increased to 10.891,5 (million TL) in year 2015 third quarter. Finally, the level of total deposits increased from 11.773,9 (million TL) to 14.007,8 (million TL) in year 2015 third quarter.

3.2.2.2 Financial Deepening

According to third quarter bulletin of TRNC CB (2015), when we examined financial deepening ratios; firstly, we see that the ratio of total assets to GDP increased from 173.4% to 186.6%. Secondly, the ratio of total gross loans to GDP increased from

111.6% to 117.5%. Finally, the ratio of total deposits to GDP increased from 140.2% to 151.1%.

In addition to this, the ratio of total gross loans to total deposits in 2014 third quarter decreased from 78% to 77% in year 2015 third quarter. Financial intermediaries represents 7,2% of GDP.

3.2.2.3 Concentration in the Banking Sector of North Cyprus

3.2.2.3.1 Total Asset Size of Banks

According to third quarter bulletin of TRNC CB (2015), when we examined concentration in the banking sector of North Cyprus, we see that top five banks asset sizes shares increased from 53.8% to 54.7%. On the other hand, share of the top ten banks in total assets declined from 78.6% to 77.9%.

3.2.2.3.2 Total Gross Loan Size of Banks

According to third quarter bulletin of TRNC CB (2015), when we examined concentration in the banking sector of North Cyprus, we see that top five banks total loans shares declined from 58.6% to 57.7%, also share of the top ten banks in total loans declined from 79.9% to 79.1%.

3.2.2.3.3 Total Deposit Size of Banks

According to third quarter bulletin of TRNC CB (2015), when we examined concentration in the banking sector of North Cyprus, we see that top five banks total deposit shares increased from 56.4% to 56.8%, also share of the top ten banks in total loans declined from 79.4% to 79.2%.

3.3 Type and Source of Data

For this study, a sample of 18 banks in North Cyprus banking industry was selected. This sample includes 12 Privately Owned Local Banks, 4 Privately Owned Foreign

Branch Banks and 2 Publicly Owned Banks. Data was collected from State Planning

Organization of North Cyprus and CB of North Cyprus.

Table 3.2: List of sample of banks selected

Types of Banks	Name of Banks
Privately Owned Local Banks	Akfinans Bank Ltd.
	Asbank Ltd.
	Creditwest Bank Ltd.
	Deniz Bank Ltd.
	Kıbrıs Faisal İslam Bankası Ltd.
	Kıbrıs İktisat Bankası Ltd.
	Limasol Türk Koop. Bankası Ltd.
	Şekerbank (Kıbrıs) Ltd.
	Türk Bankası Ltd.
	Universal Bank Ltd.
	Viyabank Ltd.
	Yakın Doğu Bank Ltd.
Privately Owned Foreign Branch Banks	Türkiye Halk Bankası A.Ş.
	HSBC Bank A.Ş.
	Türkiye İş Bankası A.Ş
	T.C. Ziraat Bankası A.Ş
Publicly Owned Banks	K.T. Koop. Merkez Bankası Ltd.
	Kıbrıs Vakıflar Bankası Ltd.

Source: CB of TRNC (2015)

3.4 Descriptive Statistics of Banks in North Cyprus

In this part, we try to show descriptive statistics of both dependent and independent

variables in two sections. In table 3.1, selected 18 banks classified into 3 groups,

such as Privately Owned Local Banks, Privately Owned Foreign Branch Banks and

Publicly Owned Banks. Following table shows us average IRS ratios of 2012 year

and after evaluation of mean ratios performed.

Table 3.3: Mean IRS of the different types of Banks (2012)

	1N	2N	3N	4W	E-IRS
All Banks Mean	0.109	0.118	0.064	0.045	0.101
Privately Owned Local Banks Mean	0.095	0.109	0.064	0.044	0.073
Privately Owned Foreign Branch Banks Means	0.171	0.172	0.071	0.057	0.197
Publicly Owned Banks Mean	0.064	0.067	0.047	0.030	0.077

Key: **1N:** (Interest Received / Total Loans)-(Interest Paid / Total Deposits), **2N:** (Interest Received + Commission Received / Total Loans)-(Interest Paid + Commission Paid / Total Deposits), **3N:** (Interest Received from Loans Only / Total Loans)-(Interest Paid to Deposits Only / Total Deposits), **4W:** (Interest Received-Interest Paid) / Total Assets, **E-IRS:** (Interest Received / Total Loans)-(Interest Paid / Total Deposits)*(Total Loans / Total Deposits)

3.4.1 Evaluation of Mean Ratios

Above table shows that different measurement techniques give different results. In general, banking sector average IRS ratio is 10.9% for 1N and 6.4% for 3N. In addition to this, Privately Owned Local Banks IRS ratio is 9.5% for 1N and 6.4% for 3N, it is almost same with banking sector average ratios. On the other hand, when we look Foreign Branch Banks row, ratio of 1N increased to 17.1% and ratio of 3N increased to 7.1%. There are a few explanations of this situation. Firstly, although all types of banks' have same interest income, cost of funding of Foreign Branch Banks cheaper than other types of banks. Secondly, Foreign Branch Banks to be able to finding cheaper funds than other banks or Foreign Banks have additional products. Lastly, Foreign Banks have interest income from different source like interest income from other banks and other interest incomes. On the other hand, Publicly Owned Banks ratios are lower than other type of banks. This indicates that efficiency of Public Banks is low and also cost of funding of these banks more expensive than other types of banks.

Below tables try to show detailed information about descriptive statistics in segmented way. Firstly, all banks displayed, and then showed separately. Thus,

detailed information about different components of banking system and also whole

system are obtained for 2012.

3.4.2 All of the Banks Selected

Table 3.4: Dependent Variables of All of the Banks (2012)

	1N	2N	3N	4W	E-IRS
Mean	0.109	0.118	0.064	0.045	0.101
Median	0.096	0.103	0.062	0.039	0.107
Maximum	0.230	0.235	0.111	0.162	0.258
Minimum	-0.010	0.046	-0.014	-0.007	-0.354
Std. Dev.	0.061	0.055	0.026	0.033	0.133
Skewness	0.545	0.923	-1.054	2.316	-2.209
Kurtosis	3.033	2.877	5.358	9.656	8.925
Jarque-Bera	0.891	2.568	7.501	49.32	40.96
Probability	0.640	0.277	0.023	0	0
Sum	1.958	2.130	1.148	0.812555	1.815
Sum Sq. Dev.	0.064	0.052	0.012	0.019007	0.299

Table 3.5: Independent Variables of All of the Banks (2012)

	CR	RR	OC	INF	RGR	NPL	MP	LR
Mean	0.021	0.08	0.046	0.04	0.005	0.148	0.051	0.306
Median	0.010	0.08	0.034	0.04	0.005	0.083	0.039	0.287
Maximum	0.144	0.08	0.216	0.04	0.005	0.769	0.234	0.622
Minimum	5.36E-05	0.08	0.019	0.04	0.005	0.014	0.0002	0.061
Std. Dev.	0.035	0	0.044	0	0	0.188	0.055	0.153
Skewness	2.840	NA	3.378	NA	NA	2.220	2.142	0.804
Kurtosis	10.217	NA	13.58	NA	NA	7.711	8.066	2.933
Jarque-Bera	63.27	NA	118.3	NA	NA	31.43	33.01	1.943
Probability	0	NA	0	NA	NA	0	0	0.378
Sum	0.377	1.44	0.823	0.72	0.09	2.673	0.918	5.518
Sum Sq. Dev.	0.020	0	0.033	0	0	0.598	0.051	0.396

Key: **CR:** (Provision for Loan Losses / Total Loans), **RR:** (Turkish Currency * RR for Turkish Currency) + (Foreign Currency * RR for Foreign Currency), **OC:** (Non-Interest Expenses / Total Assets), **INF:** Inflation Rate(%), **RGR:** Real Growth Rate(%), **NPL:** (Non-Performing Loans / Total Loans), **MP:** (Ratio of Bank Asset / Total Asset), **LR:** (Liquid Assets / Total Assets)

3.4.3 Types of Banks

3.4.3.1 Privately Owned Local Banks

Table 3.6: Dependent Variables of Privately Owned Local Banks (2012)

	1N	2N	3N	4W	E-IRS
Mean	0.095	0.109	0.064	0.044	0.073
Median	0.093	0.103	0.063	0.035	0.102
Maximum	0.230	0.235	0.111	0.162	0.253
Minimum	-0.010	0.046	-0.014	-0.007	-0.354
Std. Dev.	0.055	0.047	0.031	0.040	0.148
Skewness	0.713	1.585	-1.136	2.195	-2.110
Kurtosis	4.893	5.611	4.672	7.648	7.202
Jarque-Bera	2.811	8.432	3.981	20.44	17.74
Probability	0.245	0.015	0.137	0.000	0.000
Sum	1.147	1.306	0.770	0.523	0.875
Sum Sq. Dev.	0.033	0.024	0.010	0.018	0.240

Table 3.7: Independent Variables of Privately Owned Local Banks (2012)

	CR	RR	OC	INF	RGR	NPL	MP	LR
Mean	0.026	0.08	0.056	0.04	0.005	0.196	0.032	0.265
Median	0.010	0.08	0.041	0.04	0.005	0.092	0.028	0.247
Maximum	0.144	0.08	0.216	0.04	0.005	0.769	0.086	0.622
Minimum	5.36E-05	0.08	0.026	0.04	0.005	0.014	0.000	0.061
Std. Dev.	0.042	0	0.052	0	0	0.213	0.029	0.139
Skewness	2.162	NA	2.766	NA	NA	1.746	0.662	1.272
Kurtosis	6.44	NA	9.180	NA	NA	5.344	2.217	4.837
Jarque-Bera	15.26	NA	34.40	NA	NA	8.847	1.182	4.922
Probability	0.000	NA	0	NA	NA	0.012	0.554	0.085
Sum	0.311	0.96	0.678	0.48	0.06	2.347	0.381	3.186
Sum Sq. Dev.	0.020	0	0.029	0	0	0.501	0.009	0.213

3.4.2.2 Privately Owned Foreign Branch Banks

Table 3.8: Dependent Variables of Privately Owned Foreign Branch Banks (2012)

	1N	2N	3N	4W	E-IRS
Mean	0.171	0.172	0.071	0.057	0.197
Median	0.178	0.181	0.068	0.055	0.211
Maximum	0.228	0.229	0.092	0.066	0.258
Minimum	0.100	0.097	0.057	0.052	0.107
Std. Dev.	0.054	0.055	0.015	0.006	0.064
Skewness	-0.411	-0.523	0.624	0.644	-0.708
Kurtosis	1.903	1.981	1.859	1.830	2.100
Jarque-Bera	0.313	0.355	0.477	0.505	0.470
Probability	0.855	0.837	0.788	0.777	0.791
Sum	0.685	0.689	0.285	0.229	0.786
Sum Sq. Dev.	0.009	0.009	0.0007	0.0001	0.012

Table 3.9: Independent Variables of Privately Owned Foreign Branch Banks (2012)

	CR	RR	OC	INF	RGR	NPL	MP	LR
Mean	0.010	0.08	0.024	0.04	0.005	0.031	0.054	0.453
Median	0.009	0.08	0.023	0.04	0.005	0.017	0.053	0.456
Maximum	0.017	0.08	0.030	0.04	0.005	0.075	0.089	0.582
Minimum	0.005	0.08	0.019	0.04	0.005	0.014	0.021	0.319
Std. Dev.	0.005	0	0.005	0	0	0.030	0.028	0.144
Skewness	0.516	NA	0.390	NA	NA	1.140	0.126	-0.008
Kurtosis	1.916	NA	1.563	NA	NA	2.321	1.921	1.015
Jarque-Bera	0.373	NA	0.445	NA	NA	0.942	0.205	0.657
Probability	0.830	NA	0.800	NA	NA	0.624	0.903	0.720
Sum	0.041	0.32	0.094	0.16	0.02	0.123	0.216	1.813
Sum Sq. Dev.	7.65E-05	0	7.30E-05	0	0	0.003	0.002	0.062

3.4.2.3 Publicly Owned Banks

Table 3.10: Dependent Variables of Publicly Owned Banks (2012)

	1N	2N	3N	4W	E-IRS
Mean	0.064	0.067	0.047	0.030	0.077
Median	0.064	0.067	0.047	0.030	0.077
Maximum	0.077	0.083	0.050	0.032	0.093
Minimum	0.050	0.051	0.043	0.028	0.060
Std. Dev.	0.018	0.022	0.005	0.003	0.023
Skewness	-8.39E-17	0.000	4.84E-17	0.000	-3.41E-17
Kurtosis	1.000	1.000	1.000	1.000	1.000
Jarque-Bera	0.333	0.333	0.333	0.333	0.333
Probability	0.846	0.846	0.846	0.846	0.846
Sum	0.127	0.135	0.093	0.060	0.154
Sum Sq. Dev.	0.0003	0.0005	2.50E-05	7.15E-06	0.0005

Table 3.11: Independent Variables of Publicly Owned Banks (2012)

	CR	RR	OC	INF	RGR	NPL	MP	LR
Mean	0.013	0.08	0.025	0.04	0.005	0.101	0.161	0.260
Median	0.013	0.08	0.025	0.04	0.005	0.101	0.161	0.260
Maximum	0.021	0.08	0.028	0.04	0.005	0.164	0.234	0.331
Minimum	0.005	0.08	0.022	0.04	0.005	0.038	0.087	0.188
Std. Dev.	0.011	0	0.004	0	0	0.090	0.104	0.101
Skewness	2.67E-17	NA	-4.93E-17	NA	NA	0	9.04E-17	-1.14E-17
Kurtosis	1	NA	1	NA	NA	1	1	1
Jarque-Bera	0.333	NA	0.333	NA	NA	0.333	0.333	0.333
Probability	0.846	NA	0.846	NA	NA	0.846	0.846	0.846
Sum	0.025	0.16	0.050	0.08	0.01	0.202	0.322	0.519
Sum Sq. Dev.	0.0001	0	1.91E-05	0	0	0.008	0.011	0.010

3.5 Model Specification

The relationship between different bank spreads and independent variables is therefore specified as follows:

$$1N_{it}, 2N_{it}, 3N_{it}, 4W_{it}, E\text{-}IRS_{it} = \alpha_{it} + \beta_1 CR_{it} + \beta_2 RR_{it} + \beta_3 OC_{it} + \beta_4 INF_{it} + \beta_5 RGR_{it} +$$

$$\beta_6 NPL_{it} + \beta_7 MP_{it} + \beta_8 LR_{it} + \beta_9 DCRISIS_{it} + \beta_{10} DFOR_{it} \qquad (1)$$

where i represents banks and t the time periods. Also;

CR = Credit Risks

RR = Required Reserve

OC = Operating Cost

Inflation = Inflation Level

RGR = Real Growth Rate

NPL = Non-Performing Loans

MP = Market Power

LR = Liquidity Risk

DCRISIS = Dummy Variable of 2009 and after

DFOR = Dummy Variable of Foreign Banks

In the estimation model, there are two parts. First part is dependent variables and second part is independent variables. The variables used in this study are briefly explained in the paragraphs below.

3.5.1 Dependent Variables

In the dependent variables part, five different spread measures are selected. In the literature, many different types of IRS measurements and different spread measures give different results. In addition to this, more detailed spread measures were found. However, due to data limitation detailed spread measures is not performed and

analyzed in this study. All dependent variables selected from the literature review. First four formulas selected from studies of Brock and Suarez (2000) and fifth formula selected from Bektas (2014). For the fifth formula, Bektas (2014) specified that whole deposits not used as loans, also added that banks regulate deposit and loan rates by taking into account the transformation of deposits to the loans. Hereby, depositors side multiplied by the ratio of loans divided by deposits in the E-IRS measure. In addition to this, he uses this formula in the form of interest received from loans only and interest paid to deposits only. However, in this study formula has been changed as total interest received and total interest paid in E-IRS formula. The following paragraph outlines selected IRS Formulas.

1- 1N = Interest Received divided by Total Loans minus Interest Paid divided by Total Deposits.

2- 2N = Interest Received plus Commission Received divided by Total Loans minus Interest Paid plus Commission Paid divided by Total Deposits.

3- 3N = Interest Received from Loans Only divided by Total Loans minus Interest Paid to Deposits Only divided by Total Deposits.

4- 4W = Interest Received minus Interest Paid divided by Total Assets.

5- E-IRS= Interest Received divided by Total Loans minus Interest Paid divided by Total Deposits multiplied by Total Loans divided by Total Deposits.

3.5.2 Independent Variables

In this study, 8 independent variables selected from literature. Most commonly used independent variables are selected for this study. These independent variables performed in this study are outlined in the paragraphs that follow. In addition to this, formula and short information about independent variables are given below.

1- Credit Risk = Provision for Loan Losses divided by Total Loans.

Khediri et al. (2005) outlined the covariance relation between credit risk and interest rate, and also pay attention to credit risk effect in the determination of IRS.

2- Required Reserve = Turkish Currency multiplied by Reserve Requirement for Turkish Currency plus Foreign Currency multiplied by Reserve Requirement for Foreign Currency.

CBs try to ensure stability of the economy with the help of reserve requirements. Required Reserves increase the IRS level of the banks, hence banks tend to burden this implicit taxes to customers.

3- Operating Cost = Non-Interest Expenses divided by Total Assets.

It is the ratio of administrative costs to banks assets. Boldbaatar (2006) specified that if the cost of running bank goes up, also spreads rise up to cover the cost.

4- Inflation = Inflation Rate (%).

Inflation is the rate of change in the level of Consumer Price Index. Folawewo and Tennant (2008) outlined that inflation level display the cost of doing business in the economic system.

5- Real Growth Rate = Real Growth Rate (%).

This ratio is calculated by the rate of change of real GDP.

6- Non-Performing Loans = Non-Performing Loans divided by Total Loans.

This ratio includes credit risk. Nampewo (2012) said that NPL arises with the help of not-so-good borrower and added that banks become ineffective to recover this type of loss.

7- Market Power = Ratio of Bank Assets divided by Total Asset.

Koyuncu (2010) said that it is the ratio of each bank separately against total assets of banks in the system.

8- Liquidity Risk= Liquid Assets divided by Total Assets.

In this formula, the level of liquid assets describes the banks' ability to handle out towards liquidity risk.

Chapter 4

DETERMINANTS OF IRS IN NORTH CYPRUS

4.1 Estimation Techniques

In this part, EViews 8 statistical package used for econometric analysis and general statistical analysis. All data used in analysis gathered from CB of Northern Cyprus.

4.1.1 Unit Root Tests

In this section, Panel Unit Root Tests performed and founded that all dependent and independent variables used in this study are stationary at 1% and 5% significance levels. In stationary test three different methods used to test the stationary of variables. These methods are; Levin, Lin & Chu test, Augmented Dickey-Fuller and Phillip Peron. In addition to this, Levin, Lin & Chu test assumes common unit root process, on the other side, both ADF and PP assumes individual unit root process. Gujarati (2007) specified that ADF test makes parametric correlation with take into account that series go after with autoregressive process and setting the methodology of the test in this context. On the other side, PP test makes non-parametric correlation and PP method removes the effect auto correlation in the error terms. Following table gives detailed information about Unit Root Tests of Dependent and Independent Variables. In the light of the Unit Root Tests, we try to choose appropriate method in order to perform analysis of our study.

Table 4.1: Unit Root Tests of Dependent and Independent Variables

Variables	Levin, Lin & Chu t[*]	ADF	PP	Conclusion	Order of integration
Dependent	Statistic	Statistic	Statistic		
1N	-13.8537*	158.073*	167.090*	Stationary at 1%	I(0)
2N	-13.3502*	160.483*	167.077*	Stationary at 1%	I(0)
3N	-28.9103*	142.042*	142.585*	Stationary at 1%	I(0)
4W	-4.24850*	79.6239*	87.3188*	Stationary at 1%	I(0)
E-IRS	-13.6271*	158.524*	186.030*	Stationary at 1%	I(0)
Independent					
CR	-6.39693*	77.4541*	87.0760*	Stationary at 1%	I(0)
RR	-16.2471*	233.257*	216.223*	Stationary at 1%	I(0)
OC	-2.88251*	56.7033**	57.5849**	Stationary at 5%	I(0)
Inflation	-6.23630*	67.7544*	129.268*	Stationary at 1%	I(0)
RGR	-4.75892*	53.8377**	53.8377**	Stationary at 5%	I(0)
NPL	-15.1130*	102.756*	128.245*	Stationary at 1%	I(0)
MP	-5.60744*	58.5866**	64.6563*	Stationary at 1%	I(0)
LR	-4.54834*	62.8462*	67.5249*	Stationary at 1%	I(0)

Notes: * and ** represent 1% and 5% significance levels.

4.2 Empirical Results

In the estimation of the model, Panel Data Method used for analysis. Sample period of the model started from 2002 and ended 2012. In the previous section, Unit Root Tests analysis perfromed and founded that all variables are stationary. So this indicates that our model is long run model. Therefore, OLS Method used to estimate all equations. For every model, Hausman Test was performed to determine which model is appropriate for estimate equation. There are two models in Hausman (1978) specification test. First one is Random Effect Model and second is Fixed Effect

Model. As a result, Hausman Test showed that in all of the models Random Effect Model is most appropriate effect model. Thus, Random Effect Model used for estimate different equations.

For different spread models, three different equation models created. In every Model 1, 8 independent variables used to estimate equation. Secondly, in every Model 2 first dummy variable DCRISIS created and added into equation to show the effect of 2008 Global Financial Crisis after one year. Therefore, in DCRISIS dummy variable 0 (zero) number given for 2002 to 2008 period, on the other hand, 1 (one) number given for the period of 2009 to 2012. In every model 3, second dummy variable DFOR created and added into equation to display the effect of Local Banks onto different spread models. Thus, in DFOR dummy variable 0 (zero) number given for foreign banks and 1 (one) number given for the local banks. In addition to this, Bektas (2014) also created this dummy variable in order to display the effect of local banks.

In the light of these explanations, firstly we try to show the results of the different panel estimations in five different tables. Below tables give the detailed information about robust estimations of different spread models. Then, in discussion of results part, we try to display the effect of different independent variables onto different spread formulas and models. Finally, in section 4.3, we try to compare our study results with the channel of different studies results. In addition to this, we try to make overall analysis on IRS and outline the important points of results.

4.2.1 Results of the different Panel Estimations

Table 4.2: Robust Estimations of 1N Spread Model

VARIABLES	1N (Model 1) (RE) COEFFICIENT	1N (Model 2) (RE) COEFFICIENT	1N(Model 3) (RE) COEFFICIENT
CONSTANT	-2.62*	-2.57*	-1.65
	(-3.65)	(-2.92)	(-1.45)
CR	-13.43*	-13.48*	-12.26**
	(-2.74)	(-2.73)	(-2.46)
RR	12.19	12.00	14.33***
	(1.59)	(1.52)	(1.82)
OC	-7.99	-8.07	13.54***
	(-1.56)	(-1.56)	(1.71)
INF	0.43	0.36	0.22
	(0.18)	(0.15)	(0.09)
RGR	1.34	1.24	1.21
	(0.57)	(0.49)	(0.48)
NPL	4.63*	4.64*	4.63*
	(4.23)	(4.19)	(4.21)
MP	-3.95	-3.95	-3.67
	(-1.01)	(-1.01)	(-0.97)
LR	5.68*	5.67*	4.74*
	(6.31)	(6.26)	(4.12)
DCRISIS	-	-0.04	-0.07
		(-0.11)	(-0.19)
DFOR	-	-	-0.96
			(-1.24)
No. of banks	18	18	18
No. of obs.	198	198	198
R^2 (Weighted Stat.)	0.35	0.35	0.36
R^2 (Unweighted Stat.)	0.41	0.41	0.42

Notes: t-stat. in brackets. *, ** and *** represent 1%, 5% & 10% significance levels.

Table 4.3: Robust Estimations of 2N Spread Model

VARIABLES	2N (Model 1) (RE) COEFFICIENT	2N (Model 2) (RE) COEFFICIENT	2N(Model 3) (RE) COEFFICIENT
CONSTANT	-2.62* (-3.61)	-2.57* (-2.90)	-1.65 (-1.44)
CR	-13.88* (-2.80)	-13.94* (-2.79)	-12.71** (-2.53)
RR	12.08 (1.56)	11.90 (1.49)	13.44*** (1.68)
OC	-8.33 (-1.61)	-8.41 (-1.61)	-8.11 (1.58)
INF	0.51 (0.22)	0.43 (0.18)	0.30 (0.12)
RGR	1.33 (0.56)	1.23 (0.48)	1.20 (0.47)
NPL	4.79* (4.33)	4.80* (4.30)	4.78* (4.31)
MP	-3.96 (-1.00)	-3.96 (-1.00)	-3.68 (-0.97)
LR	5.72* (6.30)	5.71* (6.25)	4.78* (4.12)
DCRISIS	-	-0.04 (-0.11)	-0.07 (-0.19)
DFOR	-	-	-0.96 (-1.23)
No. of banks	18	18	18
No. of obs.	198	198	198
R^2 (Weighted Stat.)	0.35	0.35	0.36
R^2 (Unweighted Stat.)	0.41	0.41	0.42

Notes: t-stat. in brackets. *, ** and *** represent 1%, 5% & 10% significance levels.

Table 4.4: Robust Estimations of 3N Spread Model

VARIABLES	3N (Model 1) (RE) COEFFICIENT	3N (Model 2) (RE) COEFFICIENT	3N(Model 3) (RE) COEFFICIENT
CONSTANT	-0.25 (-1.59)	-0.31 (-1.55)	-0.20 (-0.81)
CR	-0.77 (-0.74)	-0.72 (-0.67)	-0.56 (-0.52)
RR	2.42 (1.21)	2.47 (1.29)	2.72 (1.41)
OC	-1.21 (-1.19)	-1.16 (-1.13)	-1.12 (-1.11)
INF	0.55 (0.95)	0.63 (1.04)	0.61 (1.01)
RGR	-0.57 (-0.97)	-0.47 (-0.74)	-0.48 (-0.76)
NPL	0.41*** (1.69)	0.39 (1.61)	0.38 (1.60)
MP	-0.12 (-0.19)	-0.12 (0.20)	-0.09 (-0.16)
LR	0.33** (2.02)	0.33** (2.05)	0.18 (0.79)
DCRISIS	-	0.04 (0.48)	0.04 (0.42)
DFOR	-	-	-0.11 (-0.82)
No. of banks	18	18	18
No. of obs.	198	198	198
R^2 (Weighted Stat.)	0.09	0.09	0.09
R^2 (Unweighted Stat.)	0.09	0.09	0.09

Notes: t-stat. in brackets. *, ** and *** represent 1%, 5% & 10% significance levels.

Table 4.5: Robust Estimations of 4W Spread Model

VARIABLES	4W (Model 1) (RE) COEFFICIENT	4W (Model 2) (RE) COEFFICIENT	4W(Model 3) (RE) COEFFICIENT
CONSTANT	0.04* (3.21)	0.06* (3.80)	0.07* (3.47)
CR	0.61* (6.69)	0.59* (6.43)	0.61* (6.59)
RR	0.07 (0.48)	0.00 (0.00)	0.02 (0.13)
OC	0.50* (5.03)	0.48* (4.82)	0.48* (4.90)
INF	-0.07 (-1.55)	-0.08** (-2.06)	-0.09** (-2.11)
RGR	0.06 (1.33)	0.03 (0.57)	0.03 (0.57)
NPL	-0.11* (-5.17)	-0.10* (4.91)	-0.10* (-4.90)
MP	-0.10 (-1.29)	-0.11 (-1.33)	-0.10 (-1.29)
LR	-0.02 (-1.60)	-0.03*** (-1.80)	-0.04** (-2.03)
DCRISIS	-	-0.01** (-2.00)	-0.01** (-2.05)
DFOR	-	-	-0.01 (-0.94)
No. of banks	18	18	18
No. of obs.	198	198	198
R^2 (Weighted Stat.)	0.28	0.29	0.29
R^2 (Unweighted Stat.)	0.36	0.36	0.38

Notes: t-stat. in brackets. *, ** and *** represent 1%, 5% & 10% significance levels.

Table 4.6: Robust Estimations of E-IRS Spread Model

VARIABLES	E-IRS (Model 1) (RE) COEFFICIENT	E-IRS (Model 2) (RE) COEFFICIENT	E-IRS (Model 3) (RE) COEFFICIENT
CONSTANT	-2.80* (-3.71)	-2.94* (-3.16)	-2.64** (-2.18)
CR	-18.80* (-3.63)	-18.65* (-3.57)	-18.07* (-3.38)
RR	11.70 (1.41)	12.24 (1.43)	12.61 (1.46)
OC	-13.86* (-2.65)	-13.71* (-2.60)	-13.47** (-2.51)
INF	0.38 (0.15)	0.57 (0.22)	0.51 (0.19)
RGR	-1.07 (-0.41)	-0.82 (-0.30)	-0.80 (-0.29)
NPL	5.51* (4.76)	5.47* (4.67)	5.52* (4.68)
MP	-2.18 (-0.59)	-2.18 (-0.58)	-2.14 (-0.56)
LR	6.67* (7.44)	6.70* (7.42)	6.39* (5.21)
DCRISIS	-	0.11 (0.26)	0.09 (0.23)
DFOR	-	-	-0.32 (-0.40)
No. of banks	18	18	18
No. of obs.	198	198	198
R^2 (Weighted Stat.)	0.39	0.39	0.38
R^2 (Unweighted Stat.)	0.47	0.47	0.47

Notes: t-stat. in brackets. *, ** and *** represent 1%, 5% & 10% significance levels.

4.3 Discussion of Results

In the literature review part of the study we found that different types of spreads gives different results, so the hypothesis verified with the channel of this study. In section 3.4, descriptive statistics of banks in North Cyprus displayed separately and also whole selected 18 banks. It should be mentioned that different types of banks gives different results, for example, if we look at dependent variable table of privately owned foreign branch banks we discover that mean and median levels are very high when it compared with local banks and publicly owned banks. So this situation indicates that different types of banks act differently in the determination of spreads. In addition to this, when we compare different spread calculations in section 3.4 descriptive statistics part, we find out that different bank groups gives different results. Lastly, results of the different panel estimations started with section 4.2.1, we created five different tables, this different tables shows us the effect of different independent variables onto dependent variables.

4.3.1 Effect of Credit Risk on Spreads

Our results show that Credit Risk has a negative and significant effect on 1N, 2N and E-IRS spreads. Grenade (2007) also founded same result, he added that local banks CR variable have opposite effect on spreads. And also make a comment about this finding and state that "Firstly, that commercial banks' risk provisioning is not adequately aligned with actual levels of loan losses. Secondly, commercial banks may be under provisioning." (p. 23). On the other hand, when we come to 4W spread this time CR sign changed to positive and significant. This result corresponds to Bektas (2014) findings where he stated that banks try to compensate the cost of NPL with the channel of decreasing the level of deposit rates and increasing the level of loan rates. This means that CR positive correlation with IRS. Therefore, if the level

of Provision for Loan Losses increases, also banks IRSs widens. Consequently, our findings indicate that CR is explanatory variable in the determination of spread. But it should be mentioned that sign of the CR changes with the channel of different spread formulas. In addition to this, negative sign and significance level of this variable attributed to banks under provisioning and also levels of sufficient risk provisioning not as well as loan loss levels. Finally, when we look to data of Privately Owned Local Banks, in independent variables table we founded that CR's ratio is negative in year 2002, also both Publicly Owned Banks and Foreign Branch Banks minimum ratio is zero in year 2002.

4.3.2 Effect of Reserve Requirement on Spreads

Reserve Requirement has positive and significant effect on 1N and 2N spreads. The important point here is RR became positive and significant with the help of second dummy variable DFOR in Models of 3. So this situation indicates that under the influence of domestic banks RR become positive and significant. This can also be connected to political isolation of the country; because of political isolations domestic banks of North Cyprus does not have access into international funds and different types of investment channels like secondary market. Ramful (2001) high level of RR increases the level of spread between loan and deposit rates. Mugizi et al. (2011) said that Reserve Requirement is a burden the shoulders of the banks and banks try to recover this tax with the channel of customers. Thus, banks increase the spread levels. Folawewo and Tennant (2008) added that reserve requirements duplicate the cost of funds and banks intend to recover these expenses with customers. Examples show that Reserve Requirements positively correlated with IRS. In the light of these explanations, we understand that Privately Owned Local

Banks of North Cyprus try to recover the negative effect of Reserve Requirement with reflecting on spreads.

4.3.3 Effect of Operating Cost on Spreads

Results of the Operating Cost showed that OC has positive and significant effect on 4W in three models. Boldbaatar (2006) said that if the cost of running bank increases, also spread goes into higher levels to compensate the risk of increase in costs. Ramful (2001) outlined that IRS increase with rising OCs or Expenses. In the light of these researches, we expect that IRS has positively correlated with OC. On the other side, OC has negative and significance effect on E-IRS spread in this study. This means that OC have not significant variable in the most of the spread. But we should be mentioned about 4W spread, scope of this spread is comprehensive and this means that 4W spread is different when we compare it with other spread formulas. 4W formula includes the total asset, and therefore OC has positive correlation with 4W spread. On the other side, OC has negative and significance effect on three different models of E-IRS spread. This indicates that banks can not reflect operating costs on to loan interest rates.

4.3.4 Effect of Inflation on Spreads

Inflation can be defined as rises in general price levels. Mugizi et al. (2011) and Folawewo and Tennant (2008) specified that inflation positively correlated with IRS. Chirwa and Mlachila (2004) specifies that high spreads attributed as high inflation with other independent variables. In contrast, Were and Wambua, (2013) stated that inflation rates negatively correlates with deposit interest rates, because when economy goes into boom period demand for deposits increases but this time banks do not want to increase the level of deposit rates. On the other hand, when economy goes into recession period this time banks diminishes deposit rates. In this study INF

variable founded negative and significant only in 4W spread. This situation happens with the channel of first dummy variable DCRISIS added into Model 2 and second dummy variable DFOR added into Model 3. This means that only 4W spread outcome gives same result like Were and Wambua study. On the other hand, Bektas (2014) founded that inflation is not significant determinant of bank spreads in North Cyprus banking system. Therefore, in the estimations of different spread models we founded that inflation variable is not explanatory variable and not significant determinant of bank spreads similar to Bektas study.

4.3.5 Effect of Real Growth Rate on Spreads

Nampewo (2012) and Grenade (2007) outlined that Real Growth Rate has negative impact on IRS, because of increasing economic activity, risk of loan defaults diminishes. Furthermore, Mugizi et al. (2011) added that economic growth reduces the level of lending rate, as a result IRS level decreases. On the other side, Patrick (1966) argued that increases in Real Growth Rate, raises the level of demand for banking and related financial services, hence, because of increase in demand level of IRS goes up. In this study, in the estimations of different spread models we have founded that RGR variable is not an explanatory variable and not significant determinant of bank spreads in North Cyprus Banking System.

4.3.6 Effect of Non-Performing Loans on Spreads

In the case of NPL, results showed that NPL have positive and significant effect on 1N, 2N, 3N and E-IRS. Only in 4W spread NPL has negative and significant effect. Koyuncu (2010) said that NPL raise the credit risk level of the bank and added that banks with higher level of credit risk must compensate this risk with reflecting on loans. In addition to this, Nampewo (2012) outlined that if the level NPL raises, IRS in both short and long run also increases. Romero and Rodriguez (2011) put the last

point and specified that higher level of bad loans means higher spreads. Above examples shows us NPL positive correlation with IRS. Consequently, our finding gives same result with other findings. Therefore, we understand that NPL most significant variable in the determination of spread.

4.3.7 Effect of Market Power on Spreads

Koyuncu (2010) tried to display the effect of market power on IRS, with the channel of Bank Mash formula; divided each bank assets with total assets and added that if the level of market share higher, IRS level goes down. This means that Market Power has negative impact on IRS. In contrast, Ramful (2001) asserted that market share has positive impact on IRS and added that higher share of banks charges higher interest to their loans, but lower share of banks charges lower interest to their loans. Also, Grenade (2007) used Herfindahl Index to find out Market Power ratio and commented that if the market power increases competition decreases, thus IRS increases. Beyond these explanations, we have founded that MP variable is not significant determinant of bank spreads in North Cyprus.

4.3.8 Effect of Liquidity Risk on Spreads

Liquidity Risk has negative and significant effect on 4W spread. According to Grenade (2007) in the case of excess liquidity, liquidity risk diminishes and when we look to IRS part we expect narrow IRS. So this situation reveals that liquidity levels negative impact on IRS. On the other hand, most of our study results showed that LR has a positive and significant effect on 1N, 2N, 3N and E-IRS spreads. Also, Bektas (2014) founded same outcome and outlined that liquidity is beneficial for the bank safety, but at the same time it is the opportunity cost for bank's profitability, so this means that banks compensate their opportunity costs with the help of growing spread. Results showed LR is explanatory variable in the determination of spread.

4.4 Overall Analysis of IRS

In this part of the study, we try to summarize the overall results of the different panel estimations. First of all, when we analyzed different spread models we founded that 3N spread model is least significant model with worst ratios. In the determination of the spread, we founded that different models gives us different results, on the other side, there are common features of different spread models.

First independent variable is CR, results show that CR has a negative and significant effect on 1N, 2N and E-IRS spreads. Grenade (2007) also founded same result, he added that local banks CR variable have opposite effect on spreads. On the other side, in 4W spread this time CR sign changed to positive and significant. This result corresponds to Bektas (2014) findings where stated that CR has positive correlation with IRS. Consequently, this study finding indicates that CR is explanatory variable in the determination of IRS. In addition to this, negative sign and significance level of this variable attributed to banks under provisioning and also levels of sufficient risk provisioning not as well as loan loss levels. Also, detailed data of Local Banks displayed that CR's ratio is negative and also in other types of banks CR's minimum ratio is zero in the year of 2002.

Second independent variable is RR. RR has positive and significant effect on 1N and 2N spreads. This situation occurs with the channel of DFOR in Models of 3. So this means that under the influence of local banks RR become positive and significant. This can also be connected to political isolation of the country; because of political isolations local banks does not have access international funds and investment channels. Folawewo and Tennant (2008), Ramful (2001) and Mugizi et al. (2011)

said that high level of RR increases the level of spread between loan and deposit rates. Consequently, RR positively correlated with IRS. But this situation occurs solely in the spread models of Local Banks of North Cyprus. These banks try to recover the negative effect of Reserve Requirement with reflecting on spreads.

Third independent variable is OC; results of the study showed that OC has positive and significant effect on three models of 4W. On the other hand, OC has negative and significance effect on E-IRS spread. 4W spread has wide formula, it includes total asset ratio and thus OC has positive correlation with 4W spread. On the other hand, according to Bektas (2014), we understand that banks regulate their loan and deposit rates with the channel of transformation of deposits to the loans. Because of this situation sign of the OC changes into negative. Consequently, we understand that OC has not significant variable in the determination of most spreads.

Fourth independent variable is INF, Folawewo and Tennant (2008), Chirwa and Mlachila (2004) and Mugizi et al. (2011) specified that INF positively correlated with IRS. In contrast, (Were and Wambua, 2013) stated that INF negatively correlated with deposit interest rates, in boom periods demand for deposits increases but banks do not increase deposit rates. Also, in recession periods banks diminish deposit rates. INF is found to be negative and significant only in 4W spread. This situation occurs with the help of DCRISIS dummy variable added into 4W Model 2. So this means that only in 4W Model 2 outcome gives same result with Were and Wabua study. This situation reveals the negative effect of Global Financial Crisis in 2008. On the other hand, Bektas (2014) founded that inflation is not significant determinant of bank spreads in North Cyprus. Consequently, most spread models of

our study displayed that INF is not an explanatory variable in determination of IRS in North Cyprus.

Fifth independent variable is RGR and seventh independent variable is MP. Results of the different panel estimations exhibited that RGR and MP variables are not an explanatory variable; also they are not significant determinant of bank spreads in North Cyprus Banking System.

Sixth independent variable is NPL; results showed that NPL have positive and significant effect on 1N, 2N, 3N and E-IRS. Romero and Rodriguez (2011), Koyuncu (2010) and Nampewo (2012) founded same results. So this situation pointed out that more bad loans means expanding IRS. Therefore, NPL has most significant variable in the determination of spread.

Eighth independent variable is LR, most of our study results showed that LR has a positive and significant effect on 1N, 2N, 3N and E-IRS spreads and also Bektas (2014) find out same result in the same direction. He added that liquidity is opportunity cost for bank's profitability and banks compensate their opportunity costs with expanding IRS. Therefore, LR is explanatory variable in the determination of IRS.

Chapter 5

CONCLUSION

The main objectives of this study have been to explain the IRS and also try to find out the determinants of the IRS in North Cyprus banking system. Therefore, this study investigated to understand what IRS is and to display the determinants of the IRS. In the light of this objective, literature was reviewed. The research also determined what type of data is required. For the study after data determination, raw data was collected from CB of TRNC. In addition to this, some data of this study was obtained from State Planning Organization.

This study was organized into five chapters. The first chapter was introduction part. Second chapter was literature review related with IRS. The third chapter dealt with the methodology and data for the study. The fourth chapter was outlined the analysis of IRS. In chapter five, we make our comments and present some conclusions about IRS. In literature part, we try to display and explain the different stages of IRS from all aspects. Also, literature part provides detailed information about different stages of IRS. Data and methodology chapter outlined the data which would be used for the empirical work and also provide detail information about banking system of North Cyprus. The model specification also was introduced in this chapter. In analysis chapter, EViews 8 statistical package used for econometric analysis and general statistical analysis.

The outcome of the analysis reveals that the main determinants of IRS in North Cyprus included Credit Risk, Liquidity Risk and Non-Performing Loans. Also, these three variables become most significant variable in the determination of spreads. CR's negative sign and significance level attributed to banks under provisioning and also levels of sufficient risk provisioning not as well as loan loss levels. Also, detailed data of Local Banks displayed that CR's ratio is negative and also in other types of banks CR's minimum ratio is zero in the year of 2002. LR has a positive and significant effect on 1N, 2N, 3N and E-IRS spreads. In literature part, we discovered that liquidity is opportunity cost for bank's profitability and banks compensate these costs with the channel of expanding IRS. Our results showed that NPL have positive and significant effect on 1N, 2N, 3N and E-IRS. Most of other studies were founded same results. So this situation pointed out that more bad loans means expanding IRS.

Our study results exposed that Real Growth Rate, Market Power, Operating Costs and Inflation variables are not explanatory variables of IRS. However, our study revealed some significant findings about IRS with different aspects. INF variable was found negative and significant only in 4W spread. This situation occurs when DCRISIS dummy variable added into 4W Model 2. This may be explained by the negative effect of Global Financial Crisis in 2008. In addition to this, DCRISIS dummy variable founded negative and significant effect on second and third models of 4W spread. Also, this situation exposed the negative effect of Global Financial Crisis. On the other side, OC has positive and significant effect on three models of 4W and also negative and significant effect on three models of E-IRS. 4W formula includes total asset ratio and thus OC has positive correlation with 4W. Literature part shows that banks regulate their loan and deposit rates with transformation of

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deposits to the loans. So, sign of the OC turned into negative. Outcomes revealed that signs of this variable go to different way. Because of this, OC is not a significant determinant of IRS.

This study revealed important finding about RR and IRS. Results showed that RR has positive and significant effect on 1N and 2N spreads. This situation occurs with the channel of DFOR dummy variable in the third Models of 1N and 2N. In addition to this, results bring out that this situation occurs solely in the spread models of Local Banks of North Cyprus. Local banks try to compensate negative effect of RR with expanding IRS. Consequently, our results revealed that under the influence of local banks, RR become positive and significant. On the other hand, when foreign branch banks entered into the system, this time RR becomes insignificant.

Eventually, results of the study give some important implications both to policy makers and academia. Descriptive statistics results shows that IRS mean value is high. In addition to this, IRS level of Foreign Branch Banks higher than other types of banks (see section 3.). Study findings displayed that determinants of the IRS can be different with the channel of different spread models. Therefore, outcomes of the study are expected to shed some lights in the solution of the IRS problem of North Cyprus.

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