CONTEXT

ACKNOWLEDGEMENTS

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Firstly, I would like to thank to my mother, my father, my sister and my brothers, who gave me emotional and financial support during my school life, good and bad times.

I would like to thank to my advisor Dr. Nil Gunsel for her help and encourage me in the accomplishment of this study. I would like to thank to my all teachers, Dr. Turgut Tursoy, Dr. Berna Serener and Assist. Prof. Dr. Okan V. Safakli, who encourage me for complete this study.

Abstract:

The objective of this study is to identify the factors that contributed to bank failure in Turkish Republic of North Cyprus(TRNC) between the years 1984-2006. Using logit regression model will help in estimating the determinants of the probability of bank failure in TRNC. The explanatory variables that are used in the analysis are micro-economic variables (bank-specific variables), macroeconomic variables and financial variables. Microeconomic variables are in the context of CAMELS criteria, where C stands for Capital Adequacy; A stands for Asset Quality; M stands for Management; E stands for Earning (Profitability); L stands for Liquidity and S stands for Asset Size. Macroeconomic variables are gross domestic product (GDP), exchange rate, inflation rate and interest rate; and financial variable is implicit deposit insurance. Result of this study show that ratio of loans to total assets (low asset quality), ratio of interest expense to total assets (high interest expenses), ratio of net income to total assets (low income), logarithm of total assets (bank size) and implicit deposit insurance are important determinant of bank failure. In another word these variables have important effect on the probability of banking crises in the Turkish Republic of North Cyprus.

1. INTRODUCTION

1.1 Aim of study

The aim of this project is to identify the factors that contributed to bank failure in TRNC between the years 1984-2006.

1.2 Broad problem of area

Bank failures have not only occurred in TRNC. Many countries had experienced important banking failure problems in the world. Asian Crisis(1997), Japan(1992), Mexico(1994), Argentina, Russian, Turkey(2000-2001), Norway(1988-1992), Switzerland(1991-) etc...which these countries had experienced banking crisis.

1.3 Methodology

The methodology that is using logit regression model and CAMELS rating. The logit regression model will help in estimating the determinants of probability of bank failures. CAMELS are C stands for Capital Adequacy; A stands for Asset Quality; M stands for Management; E stands for Earning (Profitability); L stands for Liquidty and S stands for Asset Size.

1.4 Structure of the study

The study is structure to consist of the following:

Chapter 1; is introduction that explain the topic,

Chapter 2; is explaining the banking sector of TRNC; reason of banking failure in TRNC and economic rehabilitation programme,

Chapter 3; is include summary of other bank failures,

Chapter 4; is content methodology that explain logit regression model,

Chapter 5; is analysis correlation and logit result,

Chapter 6; is conclusion,

Chapter 7; is references,

Chapter 8; is appendix.

It is a well known fact that TRNC (Turkish Republic of Northern Cyprus) is using the same currency with Turkey (Turkish Lira) and receiving a continual financial aid from Turkey. From this perspective North Cyprus economy is economically and financially depended on Turkey. Therefore, North Cyprus economy has affected from the similar financial difficulties that Turkey economy experienced.

Firstly Turkey economic crises occurred at the end of 1999 through November 2000 and February 2001. These crises become a reality from the economic and political sources which led to substantial devaluation in the Turkish Lira. TRNC influenced negative on large scale by Turkey crises for using same currency with Turkey. The predict cost of the banking crises is approximately 200 trillion Turkish Liras which was around 50% of total Gross National Product. Fix exchange rate is used before the crises than floating exchange rate has used after the crises (Safaklı 2003).

TRNC economy has two banking sector pain periods which occurred 1994 and 2000s. The banking failures began with Yurtbank in 1999. The crise of Yurtbank A.S. in Turkey trigged a panic in North Cyprus and depositors and clients started to draw back fund from Yurtbank Ltd. The bank run quikly spread to other banks in TRNC.

After; Mediterranean Guarantee Bank Ltd. and Everest Bank Ltd. were place under the control of TRNC Ministery of Finance in 1994. These banks had to pay guarranteeing by government. Mediterranean Guarantee Bank Ldt. become a public and Everest Bank Ltd. was taken over by a private owner.

Between the periods 2000 and 2002 occurred the banking failures which ten financial banks were forced by the government of North Cyprus to suspend their operations. The Cyprus Credit Bank, Cyprus Liberal Bank, Everest Bank, Cyprus Yurtbank and Cyprus Finance Bank Ldt. were put under the Saving Deposit Insurance Fund and these five banks were closed in 2001. These banks began a serious banking failures in TRNC. Some banks were put under the Saving Deposit Insurance Fund in different times. Cyprus Commercial Bank, Yasa Bank, Tilmo Bank, Asia Bank were put under the SDIF in 2001. Cyprus Industrial Bank was put under the SDIF in 2002. Additionally, some banks were take control by another banks respectively. Med Bank and Hamza Bank were taken control by Seker Bank in 2001 and 2002. Finba Ltd. was taken over by Artam Bank in 2000(see appendix 1)

During the failures, TRNC had 37 survining banks. These banks 2 public, 35 banks private sectors. Ten of the these banks were cancel their operations, 2 banks were take over by other banks. Now there are 2 state banks, 2 cooperative banks, 15 commercial private banks and 6 foreign branch banks, sum of 25 banks operating in TRNC under the new Banking Law (see appendix 1). Total number of banks used in this project is 22. (See appendix2).

This paper presents a practical application of the determinants of bank failure which would help bank examiners, investors and regulators in their decisions to alert management in time, to prevent bank failure. The ability for early detection of structural or financial weaknesses in the country will help to minimize financial costs of the island that brought about by financial instability.

This project has occuranced 8 section. The first section is introduction that explain the briefly topic. The second section is explain the banking sector of TRNC; reasons of bank failure in TRNC and economic rehabilitation programme. The third section is include summary of other bank failures. The fourth section is content methodology that is explain logit model. The fifty section is explain correlation and logit results. The sixth section is conclusion. The seventh section is references and the eighth section is appendix.

2. BANKING SECTOR OF TRNC

2.1 Reasons of Bank Failure In TRNC

Government accepted liberalization policies in the economy. The liberalization had been effective in the banking and finance sector which taken over the political authority. There were not make required legal or appropriate supervision and regulation in the sector.

Allowing to be establish the holding banks which the holding banks have gone bad the capital structure and not quality their control of characteristcs. Holding banks such as Hür Bank, Cyprus Finance Bank, Everest Bank and Cyprus Credit Bank etc. Many cooperative credit and finance firms to deal in the finance industry gave rise to instencive competition (Safakli). These banks have been different structural establish than other banks. Many holding set up their own banks within low capital requirement and changeable inadequate banking law. The holding banks crises to keep enough liquid money since they rather than used these in their business risk. Holding banks provided credits within low capital which they used ineffective, inproductive and profitless investment are negative influence to bank capital and revenues.

Banking crises of North Cyprus effected from extarnal and internal functions. Turkish Republic of North Cyprus's official currency is Turkish Lira. North Cyprus has not money market and positive and negative improvement in Turkish economy has affected on TRNC. When Turkish economy has high inflation, devaluation, high interest rates; TRNC influenced.

There were not supervision mechanizms in North Cyprus. The Central Bank and The Ministary of Economy and finance applied supervision and observation of the banks. Supervisiors have not been able to obtain the need information to appropriate control.

Central Bank is owns a part of sources used by public finance and not make repayment or repayments were limited. The Central Bank of North Cyprus responsible for banking supervision and used reactive strategy which means is popular and efficient problem solving when business conditions are stable. Reactive consults planning for today. TRNC control bank started to helped development to change in the banking sector.

While the credit applications assessing and deciding, they had not professionalism. They do not take into consideration the active and passive ratios, liquidity ratios, character and cash flows.

There was not effective supervision and regulation of banks prior the the crises. The legal capital requirment for a bank before to the crises was 50 billion Turkish Lira which is very low capital, so increase the number of banks and rise the assets inadequacy in the banking sector.

Authorities are responsible for control and auditing are responsible toward the political authority. Political authority had not the knowlage expertise on the banking sector. Ministary use the sources of Central Bank at the out of banking system so , Central Bank was not last resort for banks which these effected on the crises.

2.2 Economic Rehabilitation Programme

Turkish Republic of North Cyprus was experienced banking failure between the years 2000 and 2002. Economic rehabilitation programme was expressed and carry out by the Central Bank of Turkish Republic of North Cyprus. The Central Bank was worked to gain public confidence in the banking system. The purpose of the economic rehabilitation programme was to slowly increase the quality the financial system to an international standard which to make a change of the regulatory structure improved broadly on the programme. Economic rehabilitation programme was major developing of bank's regulation and supervision. The suggest new banking law in 2002 restored the Banking Act of 1976 and Establishment Law of 1987 (Gunsel 2006). The new banking law was based on the banking law of Turkey and was deemed to be an improvement on the 11/1976 Banking Law implemented in 1976 (Safakli 2003). The new banking law provide a machanizm of tighter regulatory control of banks.

The first economic rehabilitation programme was express a full expilicit coverage deposit insurance fund which implemented in 2000. The aim of the first programme is prevent banking system from bank runs and financial panics and raise confidence in banking sectors.

Another modification act was on minimum capital requirement. One of the major problems with the 11/1976 Banking Law was that the Government allowed for the creation of a new bank with minimum capital requirements of 50 billion TL and 120 000 US Dollar (Gunsel 2006).

Under the Law of 14/2000 and 39/2001, the value increased to 2 million US Dollar (Safakli 2003) and some limitations was implemented on credit and investment which to decrease credit risks in the banking sector. According to the law credit limits have to the less than %15 or %15 of its own capital and do not exceed %60 of bank's capitals. The law of 14/2001 was assemple a Risk Centre. Risk Centre is incentive internal control and risk measurement within the banking sector. When the banking sector credit decisions, the risk centre help the banking sector.

Finally, Central Bank of Turkish Republic of North Cyprus began to be employed independently with the rehabilitation program after 2001. The Central Bank of TRNC implemented limitations on public credit. The TRNC has fiscal deficit that have been financed by the Central Bank of according the New Bank Act the Government legal preventive measure and reduced the public sector borrowing requirements. Turkish Republic of North Cyprus of Government can not to apply the required fiscal reforms to limit increasing public sector borrowing requirements.

3. LITERATURE REVIEW

Shelagh Heffernon, in 1996 analyzed an econometric and financial model of bank failure, is developed and tested. The artical used a logit model for panal data bank failure model to identify what variables are explaining bank failure. The data came from success and failed bank in Australia, Finland, France, Norway, Sweeden and U.S over the period in 1985 and 1991. There are a number of significant determinants of banking failure including falling profitability as measured by the ratio of net income to total assets. This ratio was found to be a more significant indicator than capital adequency measures and the macroeconomy as measured by performance of nominal interests. As nominal interest rates increase, the banking failure increase.

Shahidur Rahman, Lian Hwa Tan, Ooi Lyn Hew, Yih San Tan, in 2004 researched about the developed for each country that identified banks experiencing financial distress as a function of financial ratio in Indenosia, South Korea and Thailand. They was used logistic regression to analyze the data sample from 1995 to 1997 and finding capital adequacy, loan management and operating efficiency are common performance dimensions found to be able to identify problems in all 3 countries.

Nil Gunsel prepared an artical about measure of the probability of financial institutions failure in the North Cyprus banking sector and used financial information obtained from balance sheet and income statement for the period 1984 and 2002. The artical is using a multivariate logit model. Bank failure is a function of CAMELS rating systems. Consequantly, according to the microeconomic results; the low capital adequancy, high leverage, high interest expense, low liquidity, small asset size are effected the bank failure in North Cyprus.

At the another researched of Nil Gunsel, her purpose is to investigate the effect of a speculative attack on Turkish Lira in the North Cyprus sector during the 1984 and 2002. This project used logit model. The findings bank weaknesses, high interest rate, fixed exchange rate policy, low trade increased the bank failures.

The study is wrote by James B. Thomson. The purpose of this study is to model bank failures of all sizes in 1980s. The function of variables related to its solvency and used the CAMEL model.

Okan V. Safakli (2005), is researched about analyz the basic problem of banking sector in TRNC with the applied proactive and reactive strategies and make suggestion. This project have included the concents of proactive and reactive strategies, an analysis of banking crises in TRNC, structural problems of the banking sector in TRNC.

Hulya Bayir (1998), focused on the measure the effected of times deposit insurance coverage on the financial strength of banks and macroeconomic conditions on bank failure over sample of 35 privately owned commercial banks in Turkey, covering the period of 1991 and 1998. As a result full coverage deposit insurance had negative effect on bank soundness in Turkey and change in the foreing currency ratio short run to shareholder's equity definetly increase probability of bank failures.

Suleyman Bilgin Kılıc, Altan Cabuk, Serpil Canbas (2004), wrote article about to propose a methodological framework for constructing the integrated early warning system that can be used to research financial characteristics of banks and discriminant logit and probit model were estimated based on these characteristics to construct integrated early warning system. This study cover the periods 1994 and 2001 and contains financial ratios of 40 privately owned Turkish Commercial Banks.

The project is prepared by Pouran Espahbodi in 1990. The main objective of this project assesses the relative ability logit and discriminant analysis in distinguishing between failed and healthly banks and this study consisted of 48 bank failed in 1983 and another 48 matching solvent banks. This model developed in this study an objective dimension to the regulatory agencies evaluation of their policies and procedures and help them allocate their resources more efficiently by concentrating their time and efforts on investigating more probable failures.

Evridiki Neophytou, Andreas Charitou, Chris Charalambou in 2000, were analyzed the improvement and approval of failure model for United Kingdom public industrial institutions. They have employs logit model and consist three financial variables, profitability, an operation cash-flow and financial leverage variables. Their data set include 51 failed and healthy of United Kingdom public industrial institutions during period 1988 from 1997. According the result, operation cash flow has important role in predicting failures. The potatial application of the model developed by Altman (1968) was examined, but the validation results were relatively low, indicating that this model may not be applicable to more recent UK data set.

This artical have written by Andrew Logan in 2001. The purpose of this project try to find leading indicators of bank failure based on the experience of the small and medium size United Kingdom banks in the small banks' crises of the early 1990s. This artical has used logit model to analyze characteristics of the banks failed compared the banks soundness. Conclusion, the most important leading indicators of future failure the found to be a high dependence on net interest income, low profitability, low leverage, low shorth term assets relative to liabilities and low loan growth.

James Kolari, Dennis Glennon, Hwan Shin and Michele Caputo, 2000, have focused on the emprical methods to the problem of predicting large United State commercial bank failures. Data of this artical has collected a sample of 50 failed large banks matched sample of 50 health large banks from the late 1980s to early 1990s. Logit analyze develop classification early warning system(EWS) model based on the orginal samples and trait recognition is test the predictive ability of these models using the hold samples.

Natasha Konstandina (2006) investigate probability of bank failure in Russian. The multivariate logit model (needed to estimated the probability of bank failure and identify key explanatory factors influcing it) and hazard model (needed to identified which factors influence survivel time) are employed for the probabilitiy of banks failures. Result shows the microeconomic variables have explaning failures and survivel times while macroeconomic variables do not appear to be essential, banks have less effecient, it have higher chances of failure and higher balance of nonperforming loans also bring higher risk of failures.

3.1 Micro-Economic Variables (Bank-Specific)

Microeconomic variables(bank-specific variable) used many indicators to the financial performance and operations of the banks. Micro-economic variables are the key financial ratios that are designed to show CAMELS components which focus is on six keys aspects of bank's operation as according to the CAMELS framework. These are capital adequacy (total capital as a percentage of total assets), asset quality (total loans as a percentage of total assets), management quality, earnings (net income as a percentage of total assets), liquidity (total deposits as a percentage of total of loans) and asset size (total sectoral assets as a percentage of total assets). They are important and useful in reflecting the bank performance and identify their financial distress.

3.1.1.1 Camels

3.1.1.2 Capital Adequacy:

Capital adequacy is measure of solvency. It is measure of gap between a company's liabilities and assets. Capital adequacy can decrease risk and absorb losses. The role of capital as a reduce the bad effects against loan losses may stop the failure of a bank whose customers defualt on their loans. Furthermore; capital can support the financial and operation of bank, provide protection to depositors and creditors and inspire confidence in depositors and regulators.

3.1.1.3 Asset Quality:

Asset quality is as a percentage of total loans divided by total assets. Loans show the highest default rates, the asset quality of banks will deteriorate when there is an increasing number of non performing loans. When declared no value importance by the bank with worsening loan quality, more bad debts will have to be written of the books. Assuming a bank rise its provision for loan losses, there will be a reduce in the reported earnings, a year from now affecting the profitability of a bank for the current time period.

3.1.1.4 Management Quality:

Management quality have a big role in determining the future of the bank. The management set the profitability objective and determines the risk level to be undertaken by bank. The management quality of a bank can be measured by operating efficiency take place of cost management and the productivity of employees. The net operating margin, net interest margin and non interest margin are efficiency measures as well as profitability measures. Higher cost expected to be positively related with the probability of bank failure.

3.1.1.5 Earning Ability (Profitability):

Earning ability is the an important performance measure for banks. In this analyze we use earning ability which is percentage of net income to total assets. Return on Assets, Return on Equity and Net Interest Margin looks at different aspect of bank profitability. A high Return on Assets may be the result of efficient operations, a low ratio of time and saving deposits to total deposits or high return earned on assets. ROA ratio is calculate by dividing bank's net income by its average assets.

When a bank's Return on Equity is very high it disclose to be performing well from the poin of view of the shareholders. It may mean the bank is heavily leveraged and riskier. ROE is calculate by dividing a bank's net income by its average total equity.

The net interest margin measures a spread between interest revenues and interest costs that management has been able to achieve. Net interest margin is of major concern the management of bank as it signals the profitability of the bank.

3.1.1.6 Liquidity:

Liquidity is capacity of financial institution , at any time in the future to meet deposit withdraw and to satisfy potential customers on its cash flow. Customers are evaluated against potential sources of cash flows. Bank can sources cash flow from the interbank deposits and interbank borrowing capacity, central bank borrowing and generally marketable, pledgeable or securitizable investment and loans. Liquidity ratios are expected to be both positively and negatively related to the likelihood of failure. A higher liquidity may also means a weak financial investment activities and therefore may also be related to a higher probability of failure.

Measure to liquidity risk three ratios are used. The ratio of liquid assets to total assets, a higher ratio of liquid assets to total assets implies a greater capacity to discharge liabilities. The ratio of liquid asset to total deposits, a bank with more liquidity can be better position to face unexpected deposit run. The ratio of total deposit to total loans, measure the deposit runs and when information becomes available to the public on the condition of banks, a transfer of funds from fragile banks to more soundness banks indicate this ratio.

3.1.1.7 Asset Size (S):

Asset size is last variable which indicator to the financial performance of the banks. Asset size is evaluated the ratio of bank assets to total banking asset value. Asset size is have a negative effects on the probability of banking crises. That is, as the size of the banks increase it is less likely that they will probability of bank failure.

3.2 Macro-Economic Variables

Macroeconomic variables were included in the model to test whether the state of the macro-economy had any effect on bank failures. Caprio and Klingebile (1996), Gonzalez – Hermasillo, Pazarbasioglu and Billings (1997), Demirgüc–Kunt and Detragiache(1998), Eichengreen and Rose(1998), Hardy and Pazarbasioglu(1998) and Kaminsky(1999) focus on the role of macroeconomic variables in explaining specific phenomenon of banking failures. Furthermore some studies the causes of the 1997 - 1998 Asain financial crisis, especially; Radelet and Sachs(1998), Chang and Velasco(1998) focus on the adverse consequences for macroeconomic stabilization of weak financial sector. Macroeconomic variables are GDP, Exchange rate, CPI(inflation), Interest rate which measurement whether effect to banks and financial failures.

GDP; The Real GDP accordingly Demirgüc – Kunt and Detragiache(1998, 2000), Brovikova(2000), Hutchinson(2002), Yılmaz(2003), Pazarbasioglu and Hardy(1998) argue the GDP have influence on banking crises. The GDP have positively related but not significant to banking failures. If the GDP increase, banking failure decrease, so the GDP is taken as an indicator of the banking problem in North Cyprus.

Interest Rate; Bernante and Gertler(1995) state that an unexpected increase in interets rates can lead to important harm to balance sheets of firms due to fact that reduce in their cash flow result from the higher interest payment of firms. The interest rate has positive related with bank failures. The interest rate is raise, the probability of banking crises is increase.

CPI(inflation); Consumer price index have positive related with bank failures and is not significant, the opposite is right for inflation rate. Different sings are explained by a falling inflation rate in all of the countries over the estimation period eventhough the CPI was increase. The decrease inflation rate is related with an increase in bank failures.

3.3 Financial Variables

3.3.1 Implicit Deposit Insurance

Deposit insurance has been protect depositors against banks failure and employed by governments to promote the stability of banking systems. The system works between deposit owners, bank accepting the deposits and the institution taking the deposits under insurance guarantee. Deposit insurance takes its approval power from rule of law based on country's legislation. When the bank in deposits are invested can not repay the owner's deposit, an association steps in through the resolutions written in the related legislation. It pays the total amount under the insurance to the depositors.

Deposit insurance has been beginning in the many years before it become a policy of federal government. Deposit insurance have established in the United State of America in 1934 by the Federal Deposit Insurance Corporation(FDIC). The Federal Deposit Insurance Corporation has not authority to charter a bank and may only close a bank, if the bank's charterer fails to act in an emergency. It has authority to revoke an institution's deposit insurance. FDIC is official organization set up by the US Federal Government and was occurred in replay to the failure of many banks during the Great Depression in the beginning 1930's (Rose,2002:42 and Gönenc,2004:13).

The Federal Deposit Insurance Corporation has five members board that including the chairman of the FDIC; the Comptroller of the Currency, the Director of the Office of Thrift Supervision and two public members appointed by the President and verified by the Senate. A provision was added in 1996 to require that one FDIC Broad member have state ban supervisory experience.

Demirgüc-Kunt and Detragiache(2002) and Demirgüc and Huizinga(2004) found the deposit insurance desing features affect affect banking system failure.

Deposit insurance is complementary element of financial safe net that contains banking law and regulations Central Bank lender of last resort facilities and banking supervisions. (Demirgüc-Kunt and Sobaci 2001:1).

Kroszner(1998) argues that deposit insurance is favored by riskier banks, because they can extract a net subsidy at the expense of safer banks in the presence of an insufficiently risk-sencitive premium structure. Similarly; Economides, Hubbard and Palia (1996) argue that in U.S. deposit insurance was instituted for the benefit of the small, unit banks.

Calomiris and White(1994); thinking that federal deposit insurance benefit predominantly small and poorly diversified unit banks and that, had not the Great Depression reduced confidence in the banking system as a whole, their pleas for federal insurance could not have overcome the opposition of politically stronger large banks.

Deposit insurance provides important benefits to the economy. Deposit insurance guarantees small depositors that their deposits are safe and that their deposits will be immediately available to them if their bank failures. It maintains public confidence in the banking system, if the public not confidence banks could not lend money, but would have to keep depositors' money on hand in cash at all time. Deposit insurance supports the banking structure. If there were not deposit insurance, the banking industry would probably be concentrated in the hands of very few enormous banks.

The Deposit insurance policy can has explicit and implicit target. The explicit target is protect depositors and prohibit the encourage of depositors to run on a bank. On the other hand, the presence of safety net can increase credit risk by weakening market discipline and encouraging excessive risk taking consequently increasing instability in the banking sector(Gunsel2006). The implicit target is decrease the undesirable macroeconomic because of bank failures and to prohibit contagious effects of panics during crises in the financial sector. According to World Bank 2001 managed the negative effects of deposit insurance appear only in countries with weak institutional environments; without of rule of law ineffective regulation and supervision of the financial sector and high corruption (O. Safakli and E. Guryay 2007).

Deposit insurance has implemented in the Turkish Republic of North Cyprus by a law approvaled. According this law was to be applied by the Central Bank of Turkish Republic of North Cyprus. The Turkish Republic of North Cyprus Saving Deposit Insurance Fund is administered by a board of directors comprising the President of the TRNC Central Bank, two Vice-Presidents of the TRNC Central Bank, two representatives from the Ministry of Economy and one representative from TRNC Banks Association. Hence of the six members board only one member is from the private sector (O. Safakli and E. Güryay2007).

The purpose of the TRNC Saving Deposit Insurance Fund as stated in its law is to ensure saving deposits in the banks and to protect all rights of depositors and providing mechanism through which banks helps to the cost of resolving bank crises.

The Turkish Republic of North Cyprus Saving Deposit Insurance Fund including; Insurance premiums paid by bank deposits which have been dormant over ten years; improves transferred from the budget; reserve requirement late payment penalties; helps procured for this aim from Turkey and other countries, penalties exact by the TRNC Central Bank under the Banking Law and income generated by the Fund and other income (O. Safakli and E. Guryay 2007).

North Cyprus was applied three different deposit insurance policies between 1984 and 2002. The government can pay covering up to £7000. Under discretionary coverage, depositors expected that either the Government would protect the banks from insolvency or compensate them for their losses in event of bank failures. As a consequence of the 1994 banking distress years, the Government announced implicit deposit insurance i.e. discretionary protection provided by the Government in case of failure. Between 1994 and 2000 Government decision to implement the implicit discretionary guarantee increased the moral hazard.

The Government provided a full coverage deposit insurance scheme to prevent the adverse influences of a bank run from spilling over from a few banks to the whole financial system during the banking distress of 2000- 2002.

4. METHODOLOGY

4.1 Logit Regression Model

Banks are classified as failed and soundness group according to the logit model which these are dependent and independent variables. The binary dependent variables be denoted by Y, is measure of bank failure in discrete form which takes a value of 1 if banks are unsuccessful. The dependent variable is assumed for bank failures and for non failures. Explanatory variables(independent variables) denoted by X, is measure of bank soundness which take value of 0, if banks are successful. Explanatory variables are capital adequacy, income expense, interest expense, loan quality, liquidity, loan volume, profit margin, sources of revenue, management efficiency, ROE and ROA.

The latent variable Yit* is not observable. The latent variable interpreted the differences between choosing Yi =1 and Yi =0.

$$Y_{it} = \begin{cases} 1 \quad \text{If individual banks fail} & \text{If } Y_{it}^{*} > 0 \\ 0 \quad \text{otherwise} & \text{If } Y_{it}^{*} \leq 0 \end{cases}$$

The latent variable link to explanatory variables as follows:

$$Y_{it}^{*} = \beta_0 + \sum_{j=1}^{k} \beta_j X_{itj} + u_{it}$$

Y_{it}*; It is latent variable, its measure can not determined.

U_{it}; Is error term.

B_j; Beta is cofficient of independent variables.

X_{itj}; vector of k number of explanatory variables in period t for bank i

X_1; Capital Adequacy

X_2; Asset Quality

X_3; Management

X_4; Earnings

X_5; Liquidity

X_6; Asset Size

X_7; GDP

X_8; Inflation Rate

X_9; Exchange Rate

X_{10}; Interest Rate

X_{11}; Implicit Deposit Insurance

The distribution of predicted value of a logit regression has a smooth curve. The predicted probability is a transformation of the log- odds which is a linear function of explanatory variables.

$$\text{Log}\left(\frac{P_i}{1-P_i}\right) = \beta_O + \sum_{j=1}^{k} \beta_j X_{itj}$$

P_i; probability the bank i fail

1-P_i; probability the bank i will healthy

The goal of the logistic regression is to find the best fitting model to describe the relationship between the two possible outcome of dependent variable and set of independent variable.

4.1 Explanatory Variables and Expected Signs

Table1 displays a description of the selected data and expected effects on the probability of bank failure. In North Cyprus the key financial ratios that are designed to reflect CAMELS components, macroeconomic variables and financial variables are discussed below:

Table 1: Definitions and Expected Sings of Macro Variables

Variables Name	Definition	Expected Sing Failure
Bank Specific Variables:		
Capital /Asset	Total capital as a percentage of total assets	-
Loan / Asset	Total loans as a percentage of total assets	+
Net income / Asset	Net income as a percentage of total assets	-
Deposit /Loan	Total deposit as a percentage of total loans	- / +
Liquid / Asset	Total liquid assets as a percentage of total assets	- / +
Asset Size	Total sectoral asset as a percentage of total assets	-
Macroeconomic Variables :		
GDP	The growth rate of real GDP	-
Interest Rate	The real interest rates	+
Exchange Rate	In U.S dollar	+
Inflation Rate	Change in U.S dollar	-/+
Financial Variables :		
Implicit Deposit Insurance	Deposit Insurance	- / +

Capital adequacy is percentage of total capital divided by total assets. Capital adequacy is negative sign and slows probability of bank failure capital adequacy can decrease risk absorb losses.

Asset quality is measure total loans as a percentage of total assets and it is positive sign.

Management quality can be measure operating efficiency for bank it is as a percentage of interest expense divided by total asset and it is positive sign.

Earning (profitability) is net income as a percentage of total asset and increase this ratio should decrease the probability of bank failures with negative sign.

Liquidity is total deposits as a percentage of total loans and both positive and negative effects on bank failures.

Asset size is last variable which the indicate to the financial performance of the bank. Asset size is evaluated the ratio of bank assets to total banking assets and negative sign.

GDP is the growth rate of real gross domestic product that has negative sing.

Interest Rate is the real interest rate and it is positive effect on probability on bank failure.

Exchange Rate use US dollars and it is positive sing.

Inflation Rate is the change in consumer price index(CPI) and both positive and negative effect on banking failure.

Implicit Deposit Insurance is the deposit insurance that is both positive and negative sing.

5. RESULTS

5.1 Correlation Results

Correlation is the relationship between two or more variables. Correlation always lies between -1 and + 1 (-1 ≤0 ≤+1). 1 shows perfect positive correlation and -1 shows perfect negative correlation between two or more variables.

Tablo shows correlation of variable with each other. In our regression we did not include highly correlated variables in the same model.

Table 2: Correlation Analyze

	Tcta	ıoanta	patta	intexpta	ıiqta	deptl	lta	ggdp	cherusd	inf	rir	implicit
tcta	1.00											
loanta	-0.44	1.00										
patta	0.32	-0.18	1.00									
intexpta	-0.52	0.38	-0.45	1.00								
liqta	0.13	-0.62	0.18	-0.24	1.00							
deptl	0.14	-0.09	0.02	-0.02	-0.04	1.00						
lta	-0.18	-0.04	-0.11	0.11	-0.32	0.08	1.00					
ggdp	0.16	-0.06	0.17	-0.12	-0.05	0.16	0.13	1.00				
cherusd	-0.16	0.08	-0.13	0.25	0.10	-0.11	-0.28	-0.66	1.00			
inf	-0.09	0.06	-0.10	0.23	0.12	-0.07	-0.34	-0.58	0.94	1.00		
rir	0.01	0.03	0.13	-0.11	-0.10	0.00	0.20	0.56	-0.73	-0.86	1.00	
implicit	-0.02	-0.06	-0.20	-0.04	-0.08	-0.09	0.30	-0.59	0.28	0.28	-0.58	1.00

5.2 Logit Regression Results

This section shows data detailing the finding of the logit regression with estimation of six models, which estimation how a particular macroeconomic variables alteration the probability of the occurance of the event when all microeconomic variables are constant. Tables are reported for evaluation of statistical significant the level of significance for each coefficients and the macroeconomic factors with the interaction weakness of financial structures. Generally thinking the causes of failures were microeconomic variables and macroeconomic variables has not exacerbated the internal problem of financial institution.

The result of the logit analysis of selected 6 models specification and standard errors are given in paranthesis and *** ,** , * indicated significance at 1% , 5% , 10% level respectively. The quality of model specification is assessed based on the criteria of Pseudo R^2 which it symbolse of Regression analysis.

Tables 3: Logit Analysis of Determinants of Bank Fragility

Variables:	**(1)**	**(2)**	**(3)**
Bank - Specific Variables:			
Capital / Asset			-0.0133
			(0.0347)
Loan / Asset	0.0308*	0.3017*	
	(0.1628)	(0.0162)	
Interest Expense / Asset			0.1140***
			(0.0389)
Net Income / Asset	-0.0986*	-0.0951*	
	(0.0546)	(0.0549)	
Deposit / Loan	0.0011	0.0015	
	(0.0031)	(0.0030)	
Liquid / Asset			-0.0087
			(0.0208)
Asset Size	-0.9425**	-0.8429*	
	(0.4708)	(0.4471)	
Macroeconomic Variable			
Real Interest Rate			
GDP			0.0542
			(0.1143)
Inflation Rate	0.01046		
	(0.0069)		
Exchange Rate		0.0135	
		(0.0088)	
Implicit			1.8577
			(1.1509)
Constant	-11.5074***	-11.035***	5.7863***
	(3.8298)	(3.6946)	(1.8287)
Model Statistics:			
Pseudo R^2	0.1621	0.1564	0.2523

Tables 3: Logit Analysis of Determinants of Bank Fragility

Variables:	**(4)**	**(5)**	**(6)**
Bank - Specific Variables:			
Capital / Asset	-0.0141 (0.0365)	-0.014 (0.0365)	-0.0143 (0.3582)
Loan / Asset			
Interest Expense / Asset	0.1110*** (0.0380)	0.1101*** (0.0372)	0.1140*** (0.0392)
Net Income / Asset			
Deposit / Loan			
Liquid / Asset	-0.0076 (0.0209)	-0.0073 (0.0210)	-0.0075 (0.0207)
Asset Size			
Macroeonomic Variable:			
Real Interest Rate		0.0029 (0.0111)	
GDP			
Inflation Rate	-0.0021 (0.0079)		
Exchange Rate			-0.0041 (0.0105)
Implicit	1.5453* (0.8764)	1.6344 (1.0380)	1.5975* (0.8743)
Constant	-5.2964*** (1.5270)	-5.4682*** (1.6221)	5.2625*** (1.5398)
Model Statistics:			
Pseudo R^2	0.2450	0.2449	0.2515

R^2 have dependent variables and explanatory variables are employed. R^2 shows the combine effect of the independent variables and is indication of how fit the regression model. The dependent variables are assumed to be statistical that have a probability distribution. The explanatory variables are assumed to have fixed values.

Pseudo R^2 for model (1) is 16.21 which means the explanatory variables in model can only explain 16.21% of variation in dependent variables. Pseudo R^2 for model(2) is 15.64; for model(3) is 25.23; for model(4) is 24.50; for model(5) is 24.49 and for model(6) is 25.15 are implying that most of the variation of the dependent variables is explained by the explanatory variables for each model respectively. Model(3) is 25.23 have the highest pseudo R^2 and model(2) 15.64 have the lowest pseudo R^2.

The first findings suggest for microeconomic variables that the coefficient on the measure of capital adequacy(capital / asset). Capital adequacy is measurement as a percentage of total capital divided by total assets. Capital adequacy has negative effect on the bank failures and higher the probability that the bank will failed in North Cyprus.

Asset quality(loan /asset) is generally related with leverage volume. Asset quality is measurement as a percentage of total loans divided by total assets. Asset quality shows to be positively associate to the probability of bank failure and it is significant at 10% . A higher ratio may present poor loan quality and higher probability of bank failures.

Another microeconomic variable is management efficiency (interest expense / total asset). The ratio calculates as a percentage of interest expense over total assets. This ratio is to be positively and significant at %1. This suggests that an increase in interest expense increases the probability of bank failure in North Cyprus.

Earning(probability) is calculated by as a percentage of net income to total assets. Earnings measures negative and it is statistically significant at 10%. It is an higher in the ratio of net income to total assets reduce the probability of bank failures. Avary et. al (1984), Persons (1999), Heffernan (1996), Martin(1997), Thomson(1991) found profitability measures negatively related to the probability of banking failure on their researches.

Liquidity(liquid / assets) is calculates as a percentage of liquid asset to total assets. Liquidity has negatively influence on banking failures that a increase in liquidity decreases the probability of bank failures.

Assets size is final measurment of bank size for microeconomic variables. Asset size is logarithm of total asset and the ratio of total assets of a bank to total banking sector assets. Asset size has negative associated with probability of banking failures and significant at 5% and 10% which the smaller banks have a higher

probability of banking failure than the larger banks. The result suggests that large banks are perceived to be "too-big-to fail". Hance the probability of failure is low.

Macroeconomic variables were included in the model to test whether states of the macroeconomic had any influenced on the banking failures. Macroeconomic variables have including Real Interest Rate, Gross Domestic Product, Inflation Rate, Exchange Rate. These variables are not significant in the North Cyprus banking sector.

The growth rate of GDP is positive effect and the GDP increase, banking failure increase, so GDP is taken as an indicator of the banking problems in North Cyprus. Demirguc-Kunt and Detragiache(1998, 2000), Brovikova(2000), Hutchinsan (2002), Yılmaz(2003), Pazarbasioglu and Hardy(1998) argue the GDP have influences on banking crises.

Real Interest Rate is positively effect to the probability of banking crises. The interest rate is increase , probability of banking failure increase in North Cyprus. Hardy (1998) and Demirguc-Kunt (1998 ,2000) argue this is probably due to the fact that an unanticipated increase in interest rates makes it difficult for firms or households to service their existing loans. For result, this lead to an increase in banks' nonperforming loans which increase the probability of banking problems and insolvency(Gunsel 2006).

The exchange rate is positive increased the probability of bank failures in TRNC. Domac and Martinez-Peria(2003) appearance the adopting a exchange rate diminishes the probability of banking crises and found evidence exchange rate provides implicit guarntees for investors that borrow in a foreing currency.

Inflation rate is positive effect to probability of failure in model(1) and negative related to failure in the model (4).

The implicit deposit insurance is positive relationship with probability of banks failures, statistically significant at 10% level. This may suggest that existence of implicit deposit insurance increased bank failure through moral hazard and adverse selection. In another word bank managers are taking high risk as a consequence of implicit deposit insurance.

6. CONCLUSIONS

The project's aims to find the determinants of banking sectors distress in TRNC during 1984-2006. This study using logit regrsssion model which measure influence probability of banking failures on the TRNC by microeconomic variables, macroeconomic variables and financial variables.

Microeconomic factors that are significant in TRNC banking sector are Ratio of loan to total asset, ratio of interest expense to total assets, ratio of net income to total assets, and size variable(logarithim of total assets). This shows that profitability, quality of loans, size and amount of interest expenses appears to increase bank failure in TRNC.

Our result also show the growth gross domestic product, real interest rate, inflation rate, exchange rate are not significant i.e macroeconomic factors does not explained bank failure in the TRNC.

Financial variable, namely deposit insurance has also applied in the TRNC. The results reveal that implicit deposit insurance increased bank failure in TRNC. This may suggest that implicit deposit insurance increased fragility through Moral Hazard and Adverse Selection. In another word bank managers are taking high risk as a consequence of implicit deposit insurance.

7. APPENDIX 1: NAME OF BANKS IN TRNC

BANK NAMES	ESTABLISHED	CLOSED	PROBLEM
Private Banks			
Turkish Bank Ltd.	1901		
Cyprus Turkish Cooperative Central Bank Ltd.	1956		
Limosal Turkish Cooperative Bank Ltd.	1939		
Cyprus Credit Bank Ltd.	1978	2000	Closed
Faisal Islamic Bank of Kıbrıs Ltd.	1982		
Industrial Bank Ltd.	1982	2002	Under the SDFI
Cyprus Commercial Bank Ltd.	1982	2001	Under the SDFI
Asbank Ltd.	1986		
Cyprus Economy Bank Ltd.	1990		
Cyprus Eurobank Ltd.	1992		
Rumeli Bank Ltd.	1992		
Cyprus Liberal Bank Ltd.	1992	2000	Closed
Everest Bank Ltd.	1993	2000	Closed
Finba Financial Bank Ltd.	1993	2001	Change name as Artem Banl
Kıbrıs Altınbas Bank Ltd.	1993		
Denizbank Ltd.	1993		
Tunca Bank Ltd.	1994	2000	Change name Kıbrıs Yurtba in 1999
Near East Bank Ltd.	1996		
Med Bank Ltd.	1996	2001	Change name Seker BankLt
Yasa Bank Ltd.	1996		Transferred to SDFI in 2001

Erbank Ltd.	1997		
Akfinans Bank Ltd.	1997		
Yesilada Bank Ltd.	1997		
Kıbrıs Continental Bank Ltd.	1997		
Viyabank Ltd.	1997		
Hamza Bank Ltd.	1997		Sold to Seker Bank in 2002
Cyprus Finance Bank Ltd.	1997	2000	Closed
Universal Bank Ltd.	1998		
Asia Bank Ltd.	1998		Transferres to SDFI in 2001
Tilmo Bank Ltd.	1999		Transferres to SDFI in 2001
Seker Bank Ltd.	2000		

Public Banks

Cyprus Vakiflar Banks Ltd.	1982
Mediterranean Guarantee Bank Ltd.	1989

Foreing Banks

T.C.Agricultural Bank A.S.	1974
Turkish People Bank A.S.	1978
Turkiye Is Bank A.S.	1955
HSBC Bank A.S.	2002

APPENDIX 2: Operation Banks In This Project

BANKS NAME:

Credit Banks	Yesilada Bank
Liberal Bank	Continantial Bank
Everest Bank	Universal Bank
Finance Bank	Viya Bank
Commercial Bank	Artam Bank
Industry Bank	Rumeli Bank
Turk Bank	Hamza Bank
Near East Bank	Deniz Bank
Asbank	Seker Bank
Economy Bank	Mediterranean Bank
Altınbas Bank	Vakıfkar Bank

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