DETERMINATION OF THE FACTORS AFFECTING CREDIT RISK FOR THE TURKISH BANKING SYSTEM: ARDL MODEL ANALYSIS[*]

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ABSTRACT

An increase in credit risks in the banking sector adversely affect the economy and financial stability. Therefore, the controlling of the credit risk is considered one of the fundamental conditions to reduce economic and financial stability risks. In this study it is aimed to explore the credit risk determinants in Turkish banking sector during 2006q1-2015q4. In order to investigate the factors that influence the credit risk of the Turkish banking system via the interactions between unemployment rate, real gross domestic product (real GDP), inflation rate, real effective exchange rate, oil prices, broad money supply(M2), capital adequacy ratio and non-performing loans (NPLs), was estimated by using the ARDL methodology. In respect of empirical findings indicate that unemployment rate, inflation and capital adequacy ratio have turned out to significant and positive impact on the non-performing loans (NPLs) in Turkey. On the other hand, the impact of real gross domestic product (real GDP), real effective exchange rate and broad money supply (M2) on non-performing loans (NPLs) are estimated to be negative and statistically significant. However, our research does not indicate a significant relationship between credit risk ratio and oil prices. The findings in this paper implies that the unemployment rate and real gross domestic product (real GDP) may serve as leading indicators of credit risk deterioration.

Keywords: Credit Risk, Non-performing Loans, Turkish Banking System, ARDL.

JEL Classification Codes: C22, E44, E52, G21.

1. INTRODUCTION

Today, financial institutions and the financial system play a vital role in the economy. The a strong and healthy banking sector, efficient banking system help countries by transferring resources to beneficiary sectors (Mugume, 2007). The stability of the financial system is a prerequisite for strong economic growth, welfare and strong financial institutions. (Rajaraman & Vasishtha, 2002; Kroszner, 2007;Kristo, 2013;Bairamli & Kostoglou, 2010).

The global financial crises of the 2008 had devastating effects almost all the countries over the world. Many financial institutions went into bankruptcy or were bailed out by governments in developed countries (Aysan et al. ,2016). In these conditions it is to stress that a very important indicator of the financial risks of the banks is credit risk which connect directly with the level of non- performing loans(NPLs). The existence of high NPLs create problems for the banking sector's balance sheet, and poses a threat on the income statement as a result of provisioning for loan losses to banking sector of many economies around world (Kumar & Tripathi, 2012). The high level of NPL or rising tendency has forced the banks to reduce the number of new loans and thus, to decrease in loan portfolio growth (Kurti, 2016). It is also to mention that the growth of this ratio leads to not only increase in allowance to be allocated for aforementioned loans and thus, to a decrease in the profitability and capital adequacy ratio of the banks but also leads to, considered from the point of economics, negatively effects economic growth by causing to a decline in loanable funds (İslamoğlu, 2015).

The Turkish financial system is represented in its greater part from the banking system. In particular banking sector assets represent about 87 percent of the financial system in Turkey (CBRT, 2013). In the Turkish banking system the NPL level appears in concerning levels after the 2001 crisis as a result of tight monetary, fiscal policy, extensive restructuring program an comprehensive institutional reforms, the Turkish banking sector's total assets, total deposits, and total loans increased, and during this period the NPLs ratios declined significantly (Akyurek 2006; Basci 2006). However, while the ratio of nonperforming loans to total loans in the second quarter of 2008 was 3,07%, due to the signs of downturn in the global economy the baking sector's loan risk has begun to increase and the level of NPLs reached 5.35% in the fourth quarter of 2009. The nonperforming loans (NPLs) of the sector realized as 3,05% within the second quarter of 2011 compared to the fourth quarter of 2009 and fell to the level before the financial crisis. This fell to the level before the financial crisis relatively stable condition of the Turkish banking sector can be attributed to stricter and rule-based regulation and supervision that

has been maintained since the 2001 crisis (Aysan et al. ,2016). Hence the need for factors that may trigger NPLs and the analysis and the identification of the determinants of non-performing loans (NPLs) in the Turkish banking sector that will take a great importance.

The purpose of this study is to investigate determinants of NPLs as a proxy for credit risk in Turkish banking system by using the ARDL methodology. The most important advantage of the ARDL model is that it enables the use of stationary variables of different degrees while all variables have to be of the same degree and different variables can be assigned different lag-lengths in cointegration approach. The time series data to be used in the study is includes quarterly observations for the period of 2006 to 2015. To this end, in the first phase of the study the literature review was presented. In the second part included explanations about the data set used and the ARDL model applied as the method in the study, followed by obtained empirical findings. Last part included evaluation and interpretation of the findings of the study.

2. LITERATURE REVIEW

Many studies in the literature focus their attention on the non-performing loans (NPL), especially over the last years, in the context there are many empirical literatures on factors responsible for the financial vulnerabililty that affect the non-performing loans (NPLs). In this section we review the existing literature and some of these studies are listed in Table 1.

Table 1: Previous Related Studies on The Credit Risk Determinants

Author(S)	Country / Term	Methodology	Results
Kurti(2016)	Albania/ 2005- 2013	Least Squares	From the regression analysis is noticed a positive relationship between the GDP growth, the lending interest rate, foreign exchange rate and the NPLs ratio. On the other hand inflation rate is negatively related with the inflation rate is negatively related with NPLs ratio
Ahmad & Bashir (2013)	Pakistan/1990-2011	OLS	The study proved significant negative association of GDP growth, interest rate, inflation rate, exports and industrial production with NPLs; whereas CPI The negative association of exports with NPL suggests is significantly positively associated with NPLs. However three variables (i.e. unemployment, real effective of individuals and firms. exchange rate and FDI) are insignificantly associated with NPLs.
Bucur & Dragomirescu (2014)	Romania / 2008-2013	A multidimensional statistical	The money supply growth rate and the market foreign exchange rate are negatively related with credit risk and the unemployment rate is positively related with it.

		analysis	Furthermore, the credit risk is significantly and negatively affected by the exchange rate fluctuation and significantly and positively affected by the unemployment rate. The results do not indicate a significant relationship between credit risk and real GDP growth rate.
Shingjergji(2013)	Albanian/ 2005:Q1-2012:Q4	OLS	The study proved significant a positive relationship between the GDP growth, interest rate, foreign exchange rate Euro/ALL and the NPLs ratio. However the inflation rate is negatively related with NPLs ratio.
İslamoğlu(2015)	Turkey/ 2002:Q1-2013:Q4	Johansen Cointegration Test and Granger Causality Analysis	The result of econometric analysis revealed that changes in non-performing loan ratio can be explained by macroeconomic variables (commercial loan interest rates and public debt stock/GDP ratios).
Nikolaidou & Vogiazas(2014)	Bulgaria/ 2001:01-2010:12	ARDL	The results assert that Bulgaria's non-performing loans are significantly affected by the construction activity, the unemployment and the domestic lending growth. Yet, the authors found insignificant effects of the Greek debt crisis on the credit risk of the Bulgarian banking system
Vatansever & Hepşen (2013)	Turkey/ 2007:01-2013-12	OLS	Debt ratio, loan to asset ratio, confidence index-real sector, consumer price index, EURO/ Turkish lira rate, USD/ Turkish lira rate, money supply change, interest rate, GDP growth, the Euro Zone's GDP growth and volatility of the Standard & Poor's 500 stock market index does not have significant effect to explain NPL ratio on multivariate perspective. On the other hand, industrial production index (IPI), Istanbul Stock Exchange 100 Index (ISE), Inefficiency ratio of all banks (INEF) negatively, Unemployment rate (UR), return on equity (ROE), capital adequacy ratio (CAR) positively affect NPL ratio.
Nikolaidou & Vogiazas(2013)	Romania /2001:01-2010:12	ARDL	Macroeconomic variables, specifically the unemployment rate and M2 jointly with bank-specific variables (credit growth) and the Greek-specific variable (Greek loan loss provisions) influence the credit risk of the Romanian banking system
Haniifah(2015)	Uganda/2000-2013	A multiple linear regression model	Inflation rate, interest rate and GDP growth have a negative but statistically insignificant effect on NPLs while the effect of interest rate on NPLs is positive but insignificant.
Beck et al. (2013)	75 countries/200 0-2010	Fixed effects Panel Data Analysis and	Variables are found to significantly affect NPL ratios: real GDP growth, share prices, the exchange rate, and the lending interest rate. This study also suggests that real

		Arellano-Bond Panel Data Analysis	GDP growth was the main driver of non-performing loan.
Us (2016)	Turkey/2002: q1-2015q4	Fixed effects model and GMM	Non-performing loans are mostly shaped by bank-specific factors before the crisis, whereas bank-specific factors have a reduced effect after the global crisis.
Ouhibi & Hammami(2015)	The Southern Mediterranean countries (Tunisia, Morocco, Egypt, Lebanon, Jordan and Turkey)/2000/2012	OLS	The consumer prices index, the exchange rate and gross capital formation are significant with non-performing loans, while GDP, FDI, exports, the rate unemployment and surplus/deficit treasure are insignificant.
Yağcılar(2015)	Turkey/2002: q1-2013:q1	Panel Data Regression Analysis	Stock market, scale, credit/deposit ratio, liquidity and return over assets are related negatively with non-performing loans while growth, interest rates, foreign banks and capital adequacy ratio are in a positive relation. Coefficients of interest rates of credit, net interest margin and inflation are not statistically significant.
Aysan et al. (2016)	Turkey/2002: 12-2011:11	A vector autoregression model,	Asset quality in the Turkish banking system is in close association with macroeconomic variables and expectations.
Castro(2013)	Greece, Ireland, Portugal, Spain and Italy/1997:q1 -2011q3	Dynamic panel data approaches	The study proved the banking credit risk is significantly affected by the macroeconomic environment: the credit risk increases when GDP growth and the share price indices decrease and rises when the unemployment rate, interest rate, and credit growth increase; it is also positively affected by an appreciation of the real exchange rate.
Idis & Nayan (2016)	OPEC countries/200 0-2014	Panel Data Regression Analysis(OLS; fixed effect and random effect)	NPLs is significantly affected by the systemic risks factors of crude oil price volatility and environmental risks when added to the baseline of macroeconomic determinants of NPLs of GDP, inflation, lending interest and unemployment rates. The results further indicated a statistically significant inverse relationship between oil price volatility and NPLs whereas the relationship is statistically positive between environmental risks and NPLs.

3. DATASET AND METHODOLOGY

The time series data to be used in the study is obtained from the databank published by CBRT the electronic data distribution system (EDDS), Banking Regulation and Supervision Agency (BRSA), TURKSTAT, EIA and includes quarterly observations for the period of 2006 to 2015.

The variables used in the model are compound non-performing loans (npl), unemployment rate(employ), real gross domestic product (rgdp), inflation rate (inf) , real effective exchange rate (rer), oil prices(oil), broad money supply (m2) and capital adequacy ratio (capital).

The factors that influence the credit risk of the Turkish banking system will be estimated using the Autoregressive Distributed Lag Model (ARDL) with the Bound Test developed by Pesaran et al. (2001). The model to be estimated for this purpose tests the cointegration among non-performing loans (NPLs), unemployment rate, real gross domestic product (real GDP), inflation rate, real effective exchange rate, oil prices, broad money supply (M2) and capital adequacy ratio as given in equation (1) below:

$$
\begin{aligned}
\Delta npl = \beta_0 &+ \sum_{i=1}^{p} \beta_1 \, \Delta npl_{t-p} + \sum_{i=1}^{p} \beta_2 \Delta employ_{t-p} + \sum_{i=1}^{p} \beta_3 \Delta rgdp_{t-p} + \sum_{i=1}^{p} \beta_4 \, \Delta inf_{t-p} \\
&+ \sum_{i=1}^{p} \beta_5 \, \Delta rer_{t-p} + \sum_{i=1}^{p} \beta_6 \, \Delta oil_{t-p} + \sum_{i=1}^{p} \beta_7 \, \Delta m2_{t-p} + \sum_{i=1}^{p} \beta_8 \, \Delta capital_{t-p} + \beta_9 npl_{t-1} \\
&+ \beta_{10} employ_{t-1} + \beta_{11} rgdp_{t-1} + \beta_{12} inf_{t-1} + \beta_{13} rer_{t-1} + \beta_{14} oil_{t-1} + \beta_{15} m2_{t-1} \\
&+ \beta_{16} capital_{t-1} + \varepsilon_t
\end{aligned}
$$

....(1)

The lag length represented by p has to be determined to implement the bound test approach in equation (1). At the next stage, F statistics should be implemented on the first lags of dependent and independent variables in inquiring the presence of a cointegration. The hypotheses necessary for this test are given below:

$$H_0 : \beta_9 = \beta_{10} = \beta_{11} = \beta_{12} = \beta_{13} = \beta_{14} = \beta_{15} = \beta_{16} = 0$$

$$H_1 : \beta_9 \neq \beta_{10} \neq \beta_{11} \neq \beta_{12} \neq \beta_{13} \neq \beta_{14} \neq \beta_{15} \neq \beta_{16} \neq 0$$

For cointegration, the value of F statistics calculated is compared to upper and lower critical values in the table presented in Peseran et al. (2001). If the F value is smaller than the lower critical value, it is decided that there is no cointegrating relationship among series. If the calculated F statistic is between the upper and lower critical values, a final comment cannot be made, and other cointegration tests are required. On the other hand, if the calculated F statistic is

higher than the upper critical value, it is concluded that there is a cointegrating relationship among series. Once a cointegrating relationship is found among the series, ARDL models are established to identify short- and long-term dynamics.

4. EMPIRICAL RESULTS

Granger and Newbold (1974) state that it is possible to encounter spurious regression problem if non-stationary time series are used. Therefore, non-stationary time series in analyses would cause unreliable results among variables. For this reason, Augmented Dickey- Fuller (ADF) and Phillips-Peron (PP) unit root tests which are among the most frequently used methods in testing the stationary properties of series are employed in this study. The test results are given in tables 2 below.

Table 2: Results of ADF and PP Unit Root Test Statistics

Variables	ADF	%1 level	%5 Level	%10 level	PP	%1 level	%5 level	%10 level
NPL	-1.52	-3.62	-2.94	-2.61	-2.01	-3.61	-2.93	-2.60
ΔNPL	-4.50	-3.63	-2.95	-2.61	-4.38	-3.62	-2.94	-2.61
EMPLOY	-2.03	-3.63	-2.95	-2.61	-2.73	-3.61	-2.93	-2.60
Δ EMPLOY	-5.61	-3.63	-2.95	-2.61	-11.84	-3.61	-2.93	-2.60
RGDP	-0.33	-3.61	-2.94	-2.60	-0.40	-3.61	-2.93	-2.60
ΔRGDP	-4.54	-3.61	-2.94	-2.60	-4.49	-3.61	-2.94	-2.60
INF	-1.08	-3.61	-2.94	-2.60	0.68	-3.61	-2.93	-2.60
ΔINF	-10.47	-3.61	-2.94	-2.60	-38.32	-3.61	-2.93	-2.60
M2	-1.24	-3.61	-2.93	-2.60	-1.21	-3.61	-2.93	-2.60
ΔM2	-5.89	-3.61	-2.93	-2.60	-6.04	-3.61	-2.93	-2.60
OIL	-2.21	-3.61	-2.94	-2.60	-1.77	-3.61	-2.93	-2.60
ΔOIL	-4.96	-3.62	-2.94	-2.61	-4.29	-3.61	-2.93	-2.60
RER	-1.83	-3.61	-2.93	-2.60	-2.05	-3.61	-2.93	-2.60
ΔRER	-6.28	-3.61	-2.94	-2.60	-6.28	-3.61	-2.93	-2.60
CAPITAL	-1.47	-3.61	-2.94	-2.60	-1.56	-3.61	-2.93	-2.60
ΔCAPITAL	-5.94	-3.62	-2.94	-2.60	-6.34	-3.61	-2.94	-2.60

According to the test results, the variables the variables npl, employ, rgdp, inf , rer, oil, m2 and capital are made stationary by taking their first differences as they are not stationary at their levels, These later variables therefore present *I(1)* characteristic.

The appropriate number of lags in the model was determined by giving maximum 8 lags according to Schwartz Information Criteria (SIC). Table 3 contains results of Pesaran's Bound Test.

Table 3: Bound Test Results

k	F-Statistic	5% Lower Bound	5% Upper Bound
7	35.86	2.32	3.50

Considering the results given in Table 3 the F value exceeds the upper critical value cited in Peseran et al. (2001). This result verifies that there is a cointegrating relationship among variables. Therefore, an ARDL model may be established to identify short and long term relations. Therefore it will be possible to estimate short-term relations among variables by using error correction methodology. The empirical model regarding the short-term dynamics is given in equation (2).

$$\Delta dibs = \beta_0 + \sum_{i=1}^{p} \beta_{1i}\,\Delta npl_{t-p} + \sum_{i=1}^{p} \beta_{2i}\,\Delta employ_{t-p} + \sum_{i=1}^{p} \beta_{3i}\,\Delta rgdp_{t-p} + \sum_{i=1}^{p} \beta_{4i}\,\Delta inf_{t-p}$$
$$+ \sum_{i=1}^{p} \beta_{5i}\Delta m2_{t-p} + \sum_{i=1}^{p} \beta_{6i}\Delta oil_{t-p} + \sum_{i=1}^{p} \beta_{7i}\Delta rer_{t-p} + \sum_{i=1}^{p} \beta_{8i}\Delta capital_{t-p}$$
$$+ \beta_{96} ECT_{t-1}$$

....(2)

Table 4 contains the estimation results of the error correction model with appropriate lags obtained through SIC.

Table 4: Test Results of Error Correction Model

Variables	Coefficient	t statistic	p value
DNPL(-1)	-0.160335	-2.332329	0.1019
DNPL(-2)	-0.424104	-6.409570	0.0077
DNPL(-3)	0.405651	8.417237	0.0035
DNPL(-4)	-0.097196	-2.429924	0.0933
DLOGRER	-0.006578	-4.712022	0.0181
DLOGRER(-1)	-0.017566	-8.342133	0.0036
DLOGRER(-2)	-0.014354	-8.093215	0.0039

DLOGM2	-0.035634	-8.618618	0.0033
DLOGM2(-1)	-0.017018	-2.805632	0.0675
DLOGM2(-2)	-0.028855	-8.489141	0.0034
DLOGM2(-3)	-0.020309	-5.240848	0.0135
DLOGINF	-0.001385	-4.259250	0.0237
DLOGINF(-1)	0.001438	3.047031	0.0556
DLOGINF(-2)	0.003125	7.205979	0.0055
DLOGINF(-3)	0.001932	8.050702	0.0040
DLOGGDP	-0.041219	-11.03248	0.0016
DLOGGDP(-1)	-0.033100	-8.797046	0.0031
DLOGGDP(-2)	-0.104919	-15.17349	0.0006
DEMPLOY	0.080626	10.88121	0.0017
DEMPLOY(-1)	0.084412	8.231831	0.0038
DEMPLOY(-2)	0.053038	7.754593	0.0045
DEMPLOY(-3)	0.126694	10.87832	0.0017
DCAPITAL	-0.023756	-2.974258	0.0589
DCAPITAL(-1)	0.073104	9.281834	0.0026
DLOGOIL	0.004826	12.37609	0.0011
DLOGOIL(-1)	-0.000445	-0.977623	0.4004
DLOGOIL(-2)	-0.000129	-0.483066	0.6621
DLOGOIL(-3)	-0.006148	-16.40139	0.0005
ECT(-1)	-0.851316	-2.487383	0.0887

According to Table 4, the error correction term (ECT) has a negative sign as expected and is statistically significant showing a strong dynamic adjustment process to deviations from equilibrium. The error correction coefficient (ECT) is highly significant, bears the correct sign and points to the existence of a long-run relationship between the variables and suggests a moderate adjustment process. In specific, about 85.1 % of the disequilibria of the previous quarter's shock adjust back to the long run equilibrium in the current quarter. Table 5, on the other hand, presents long-term coefficient findings based on the ARDL model.

Table 5: Long-Term Coefficients Based on the ARDL Model

Variable	Coefficient	P Value
DEMPLOY	0.251927	0.0015
DLOGGDP	-0.138744	0.0000
DLOGINF	0.002990	0.0888
DLOGM2	-0.078638	0.0051
DLOGOIL	-0.000538	0.4378
DLOGRER	-0.029587	0.0011
DCAPITAL	0.041163	0.0344
C	0.003854	0.0015

Result in Table 4 reveals that unemployment has a significant positive impact on non-performing loans(NPLs), indicating that an increase in unemployment rate increases NPLs by 0.251. This finding is in line with theoretical expectation and implies that increasing unemployment is considered to have a significantly adverse effect on loan portfolio quality (Quagliariello 2004; Baboucek & Jancar 2005; Vogiazas & Nikolaidou 2011a, b). The higher the unemployment rate the more the financial difficulties of the affected households and the higher their chances of credit default. Furthermore, a fall for demand of goods and services as a result of rise in unemployment rate can affect businesses' cash-flows which eventually increase credit default hence higher NPLs. This result also indicate that the deterioration loan portfolio quality, mainly due to rising unemployment, increases the vulnerability of the Turkish banking system.

Result in Table 4 shows that there is a significant empirical evidence of negative association between growth in gross domestic product and non-performing loans (NPLs), indicating that an increase in GDP decrease NPLs by 0.138 as reported by Makri et al. (2014), Ghosh (2015), Louzis, Vouldis & Metaxas (2012), Khemraj & Pasha (2009), Salas & Suarina, 2002; Rajan & Dhal, 2003; Fofack, 2005 and Jimenez & Saurina, 2005. The finding on the relationship between GDP movement and NPL ratios is in line with theoretical expectation and the macroeconomic environment described by indicators such as GDP growth influences borrowers' balance sheets and their debt repayment capacity. If we look into the explanation of this negative relationship

provided by the literature we find that growth in the gross domestic product usually increases the income which ultimately enhances the loan payment capacity of the borrower which in turn contributes to lower bad loan and vice versa (Khemraj &Pasha, 2009). Looking at these results from a different perspective, we conclude that the credit risk tends to increase when the economic environment deteriorates.

On the other hand, inflation has a significant positive but minor impact on non-performing loans(NPLs), suggesting that an increase in inflation rate increases NPLs by 0.002. This finding shows that high inflation will be the cause of decline in real income of borrowers and trigger NPLs as it reduces real income.

There is a significant empirical evidence of negative association between M2 and non-performing loans (NPLs), indicating that an increase in broad money supply (M2) decrease NPLs by 0.07. This finding implies that has a reverse relation with credit risk and considering that increasing money supply will decrease the interest rate and create the opportunity of cheaper funds (Ahmad & Ariff, 2007). Therefore, when central banks expand the monetary base, the bank debts will more easily repay and this will contribute to decreasing NPLs in Turkish banking sector which is confirmed in the research of Kalirai & Scheicher (2002) on Australian banks, Waeibrorheem & Suriani (2015) on Malaysian banks, Bofondi & Ropele (2011) on Italian banks. On the other hand there is a insignificant empirical evidence of between growth in oil price and non-performing loans (NPLs).

Real effective exchange rate (RER) has a significant negative impact on non-performing loans(NPLs), stating that an increase in Rate decreases NPLs by 0.029. This finding is in line with the study done by Zeman & Jurca (2008). If we look into the explanation of this negative relationship provided by the literature an increase in real exchange rate favours domestic exporters as it makes domestic products more competitive and increases the exporters' profits. Therefore, the financial situation of the exporters is improved which reduces the default rate (Haniifah ,2015). On the other hand, The study findings are also in line with the work of Babihuga (2007), Faward & Taqodus (2013) and Quagliariello (2003) who argued that the increase in exchange rates has a positive income effect through increase in net exports, and thereby increasing the repayment capacity of borrowers in an economy (Haniifah ,2015).
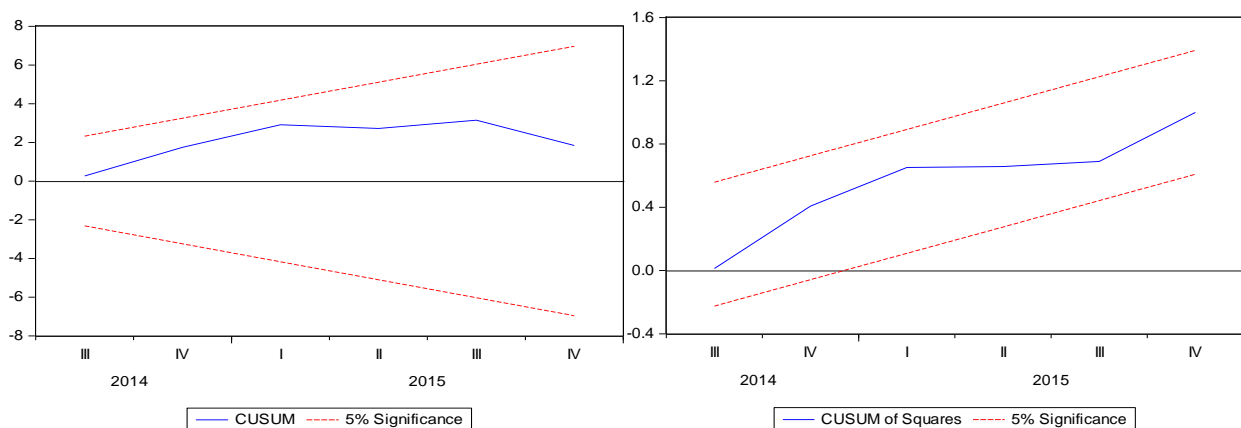
Finally the empirical results show that existence of a positive and significant relationship between capital adequacy ratio and non-performing loans (NPLs), suggesting that an increase in capital adequacy ratio increase NPLs by 0.041 as reported by Yağcılar & Demir (2015), Vatansever &Hepşen(2013), Espinoza & Prasad(2011). This finding implies that a strong equity structure banks are not under regulatory pressures to reduce their credit risk and take more risks. Therefore, this will contribute to increasing NPLs in Turkish banking sector .

Some diagnostic tests related to autocorrelation, heteroscedasticity, and whether the model is stable are also conducted. Diagnostic test results are given in the Table 6 and Figure 1. According to these test results, it is found by the Breush-Godfrey LM and ARCH tests that problems of autocorrelation and heteroscedasticity are not present, respectively. CUSUM and CUSUM of Squares test also shows that the model is stable.

Table 6: Diagnostic Test Results

R^2	0.99	AIC	-13.38
Log likelihood	263.20	SIC	-12.09
Breusch-Godfrey LM	0.62 (0.69)	ARCH	0.33 (0.85)
F statistic	36.38 (0.00)		

Figure 1: CUSUM and CUSUM of Squares Test Results

CONCLUSION

The recent global financial crisis showed that financial stability is a vital importance. However, recent financial crieses has remained a key challenge for policy makers, such as problems on the issue of the loan portfolio quality to ensure financial stability.Thus, to understand the causes of the problem of the asset quality it is necessary to identify the factors that can cause the increase of nonperforming loans. In reality, high levels of non performing loans(NPLs) are very dangerous not only threaten a financial stability while a festering asset quality but cause the increase of banking credit risk while struggling with liquidty or bankruptcy problems.

In this study we explore the ARDL approach to investigate the determinants of credit risk as proxied by non-performing loans (NPLs) in the Turkish banking system. Based on the data on CBRT the electronic data distribution system (EDDS), Banking Regulation and Supervision

Agency (BRSA), TURKSTAT, EIA, this paper explore the interactions between factors that affect credit risk, such as: unemployment rate, real gross domestic product , inflation rate, real effective exchange rate (RER), oil prices(oil), broad money supply, capital adequacy ratio (capital) and non-performing loans (NPLs) in Turkish banking sector during 2006q1 to 2015q4. Our regression analysis findings confirm according to which unemployment rate, inflation and capital adequacy ratio are positively related with credit risk.Furthermore, our findings revealed that the credit risk is significantly and negatively affected by real gross domestic product (real GDP), real effective exchange rate and broad money supply (M2). However, our research does not indicate a significant relationship between credit risk ratio and oil prices.

According to the empirical results, unemployment rate and real gross domestic product (real GDP) has been the main driver of non-performing loans. On the other hand, asset quality in the Turkish banking system is shaped by macroeconomic environment and expectations via feed-back effects between the financial sector and the real economy. Hence, if the economic environment is better in macroeconomic condition or the expectations toward the economy improve, borrowers can easily find cheap credit and thus, leads to positively effects financial stability by causing to tends to increase asset quality.

Our findings have several implications in terms of policy decisions. It can help identify the causes of NPL ratio. Specifically, real GDP and unemployment may serve as early warning indicators of credit portfolio and loan portfolio quality deterioration. These findings can be used as a useful guide in making policy decisions and thus lead to a better understanding of banking and credit market conditions that will contribute to financial stability by strengthening the resistance of financial markets.

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