

## Nonperforming Loans in Albania

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### Abstract

*This paper examines the continuous increase of nonperforming loans in Albania as a result of the problems caused by economics crisis and the decrease of incomes coming from emigrants. The methodology used consists on applying Johansen multivariate co-integration test to show the long-run relationship that exists between nonperforming loans and: real GDP; unemployment; inflation; loan interest rate; and remittance. The data taken are calculated on quarterly basis from 2003 to 2013. The results show that nonperforming loans and all these variables are co-integrated but this is a weak co-integration in the long run.*

**Keywords:** Nonperforming Loans, Real GDP, Unemployment, Inflation, Loans Interest Rate, Remittance, Co-integration Test, Albania

### 1. Introduction

A boom in lending activity has characterized Albania in these last 10 years. One of the main sources that promotes economic growth for this country that has been in transition since it tear down the communism system are investments which are generally financed by crediting of banks. In this situation on one hand it can be said that the banking system is one of the most developed sectors in the country but on the other hand even though there has been an increase in the level of banking intermediation the progress that has been made is not good enough compared with the other countries and compared with the goals that the country has. The financial stability of Albania is being endangered by the increase of the overall level of the nonperforming loans. A nonperforming loan can be defined as a loan which does not provide incomes anymore because the full payment of the principal and interest is not provided, the payment may be 90 or more days late and the maturity date has passed and the payment has not been completed. Nonperforming loans cause mismatches of maturities between assets and liabilities, they decrease profitability and increase liquidity problems so their continuous increase may bring banks to insolvency.

In the first period of transition the causes of nonperforming loans were mainly related with the inefficiency of state owned banks and enterprises but now the causes of the increase of level of nonperforming loans are related with the micro and macroeconomic environmental factors where banks operate. There are two main factors that have contributed in the increase of nonperforming loans in Albania: economic crisis that directly affects GDP, unemployment and inflation of the country and the decrease of the incomes coming from emigrants. This increase of nonperforming loans shows that individuals and businesses have difficulties in making their payments and this increases the risk of the whole economic system of the country. Another factor that should be taken in consideration is that during the first years of transition the loans that were given weren't well studied. A loan register did not exist just some years ago so banks gave more than one loan to the same individual or business even though they were unable to pay it back.

What is worrying is that majority of banks believe that the level of nonperforming loans is much higher than it is reported so according to them the level of nonperforming loans will not decrease in short term. Nonperforming loans have affected more business loans than consumer loans and business loans comprise more than 70% of the total lending activity in Albania. For the business loans the most problematic ones were those ones that were given to construction companies

The study of nonperforming loans and the factors that has caused their increase is very important because in a situation where nonperforming loans are continuously increasing especially in a developing country like Albania they are

the main obstacles of financial stability and economic growth so it is the main duty of regulators and policy makers to take immediate measures for the improvement of the situation.

After the introduction the rest of the paper consists on: section 2 literature review, section 3 data and methodology where are explained the variables and methodology used, section 4 an analysis made on the results and section 5 conclusions.

## 2. Literature Review

Recent studies especially Mwanza Nkusu (2011) has concluded that the linkages between nonperforming loans (NPL) and macroeconomic performance attributes to nonperforming loans a central role because a sharp increase of nonperforming loans cripples macroeconomic performance from several fronts. This sharp increase in NPL which weakens macroeconomic performance also activates a vicious spiral that exacerbates macro financial vulnerabilities. From another study carried out from Roland Beck, Petr Jakubik and Anamaria Piloiu (2013) was suggested that GDP growth is the main driver of nonperforming loans. Therefore a drop in global economic activity remains the most important risk for bank asset quality. At the same time, asset quality in countries with specific vulnerabilities may be negatively affected by additional factors. In particular, exchange rate depreciations might lead to an increase of nonperforming loans in countries with a high degree of lending in foreign currencies to unprotected borrowers. A drop in stock prices also negatively affects bank asset quality for example those countries with large stock markets relative to the economy. Similarly another study made by Bruna Skarica (2013) concluded that GDP is the main driver of nonperforming loans and that the high levels of NPLs are the legacy of the crisis. The results of a study made by Nir Klein (2013) showed that the level of NPLs depends on macroeconomic conditions and banks' specific factors, particularly the results showed that the increase in the level of NPLs is caused by the increases in unemployment, depreciation of exchange rate and increase of inflation. The same result that the level of NPLs depends on macroeconomic variables and banks' specific factors was found also by another study carried out by Dimitrios Angelos and Vasillios (2011) which was a study made on Greek banking system. Abdelkader Boundriga, Neila Boulila Taktak and Sana Jellouli (2014) also carried out a study to show the strong relationship that exists between nonperforming loans and bank specific variables and found out that higher capital adequacy and higher provisions are those bank specific variables that decrease the level of nonperforming loans. In Italy and Spain according to Carlos Andres and Olaya Bonilla (2012) it was concluded that macroeconomic variables are strong determinants of NPLs where the most statistically significant ones are unemployment and GDP. Another study showed that the main contributors of the increase of the level of NPLs are some factors controllable by commercial banks and they are: the diversification of funds and weak credit analysis Evelyn Richard (2011). Also for developing countries it was specifically concluded that rapid growth of nonperforming loans causes: an increase of inflation, decline of economic growth, substantial depreciation of exchange rate, high budget and balance of payment deficit influencing the banking sector with increasing interest rate and money supply which reduces the repayment capacity of borrowers Munib Badar, Atiya Yasmin Javid and Shaheed Zulfiqar (2013). This malfunctioning of the banking sector which is directly related with its inefficiency of resource allocation destroys the real economic performance of a country. The level of NPLs in India according to Krishna Prasanna (2014) depends on macroeconomic variables and moreover from his results he showed that 52% of changes in NPLs is attributed to macroeconomic variables. In Romania was found that a strong correlation exists between NPLs and unemployment rate so when unemployment increased the level of NPLs increased too, Iulia Iuga and Ruxandra Lazea (2012). In Kenya, Daniel Kwambai and Moses Wandera 2013 have concluded that credit information sharing and level of nonperforming loans are really related to each other. Credit information sharing plays a key role because it increases transparency among financial institutions, helps the banks lend prudently, decreases the risk level to the banks, acts as a borrowers discipline against defaulting and it also reduces the borrowing cost. When the economic sectors grow, the level of lending to these sectors will also increase and in return the level of nonperforming loans tends to increase as the sector grows. The main factors that lead to bad loans in the bank are; lending to borrowers with questionable characters, serial loan defaulters, high interest rates that make it hard for some to pay back the loan, diversion of funds by borrowers. These causes make many borrowers not able to fulfill their obligations hence leading to many nonperforming loans and most of these factors are due to information asymmetry in the banking industry. Except information sharing as an important determinant of nonperforming loans in developing countries it was also concluded that corruption is an important factor that affects the level of nonperforming loans in these countries Fawad Ahmad (2013). This increase of nonperforming loans that is seen in many different countries is a very problematic issue because it leads to inefficiency of banking sector Linbo Fan, Sherill Shafer (2004) and Mohd Zain Abd Karim, Sok-Gee Chan, Sallahudin Hassan (2010).

### 3. Data and Methodology

In this paper there are used five macroeconomic indicators to analyze the increase of nonperforming loans in Albania. These variables are: real GDP; unemployment; inflation; loan interest rate; and remittance. The data of these variables are calculated on quarterly basis from 2003 to 2013 and they are taken from quarterly reports of Bank of Albania.

Real GDP is negatively related with nonperforming loans. An overall increase of GDP brings economic development to a country so when it increases the level of NPL decreases.

Unemployment is positively related with nonperforming loans. An increase in the unemployment level means that there will be an increase in the level of people who cannot make the payments of the loans taken because of losing their jobs.

Inflation is positively related with nonperforming loans. An increase of inflation forces monetary regulators to increase interest rate to control inflation which means that there will be an increase in the cost of borrowing.

Loan interest rate is positively related with nonperforming loans because it means that the cost of borrowing will increase so people will have to pay more and they may not be able to make this payment if the loan interest rate increases.

Remittance is negatively related with nonperforming loans. A decrease in the incomes coming from emigrants causes a depreciation of home currency and those people who make the payments of their loans in dollars or euro so in foreign currency will have to pay more.

The methodology used is a multiple regression, so the model specification is:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + U$$

Where: Y= nonperforming loans

B<sub>0</sub>= intercept

X<sub>1</sub>= real GDP

X<sub>2</sub>= unemployment

X<sub>3</sub>= inflation

X<sub>4</sub>= loan interest rate

X<sub>5</sub>= remittance

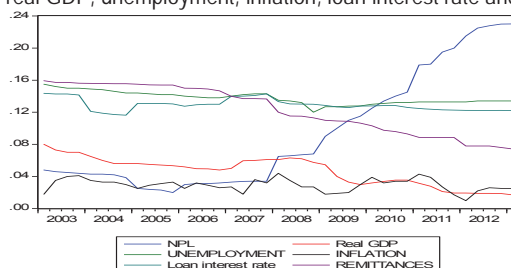
U= random error

$$\text{So NPL} = B_0 + B_1\text{GDP} + B_2\text{UN} + B_3\text{INF} + B_4\text{INT} + B_5\text{RE} + U$$

Firstly all the variables are tested if they have a normally distribution. A normal distribution means a symmetric distribution and it has a bell shape with a peakness leading to a Skewness of 1 and a tail-thickness leading to a Kurtosis of 3. If the Skewness is not near to 0 and Kurtosis is not near to 3 the normality distribution is rejected. After doing this on all variables is applied Augmented Dickey Fuller unit root test meaning that all variables are examined if they have a unit root so if they are non stationary. Non stationary means that a series does not fluctuates around a mean value and does not have a tendency of coverage toward mean value. If for 1%, 5% and 10% level the probability is greater than 0.05 it means that the variable has a unit root (non stationary) so it is first differenced becoming stationary meaning that for 1%, 5% and 10% level the probability is lower than 0.05. The long run relationship that exists between nonperforming loans and all five other variables (real GDP, unemployment, inflation, loan interest rate, remittances) is shown by using Johansen co-integration test. If in the Johansen co-integration test the value of Trace statistic is greater than 5% critical value and if the Max-Eigen statistic is greater than 5% critical value it means that in the long run there exist a strong co-integration between nonperforming loans and: real GDP, unemployment, inflation, loan interest rate and remittances.

### 4. Estimated Results

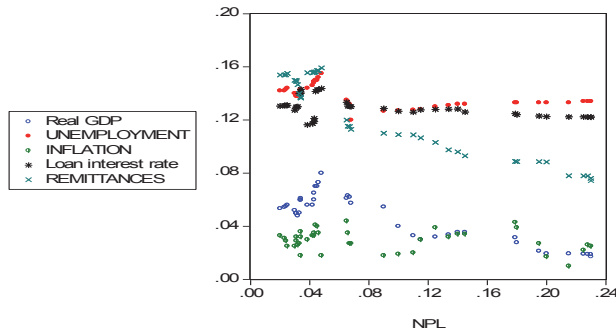
**Graph 1.** Nonperforming loans, real GDP, unemployment, inflation, loan interest rate and remittance series



The fluctuations of these variables show the economic situation which Albania is facing, where:

1. The problems caused from the economic crisis can be easily seen in the decrease of real GDP level, in the decrease of unemployment and in the continuous changes of inflation.
2. The incomes from emigrants coming mainly from Greece and Italy also have decreased because of the economic situation that also these countries have been facing.
3. And nonperforming loans are increasing over time because of the problems caused from economic crisis, from decrease of remittances and from banks not being careful on giving loans.

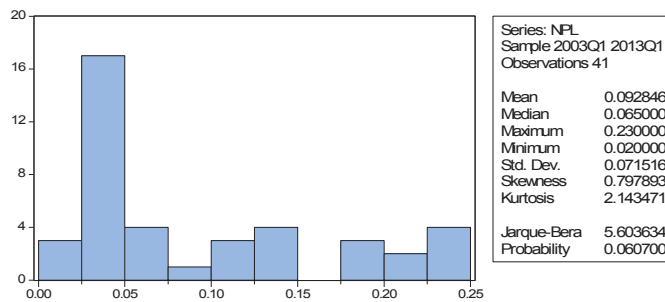
**Graph 2.** Real GDP, unemployment, inflation, loan interest rate and remittances in Albania, scatter diagram



In Graph 2 when moving to the right is seen what kind of relationship nonperforming loans have with real GDP, unemployment, inflation, loan interest rate and remittances, specifically:

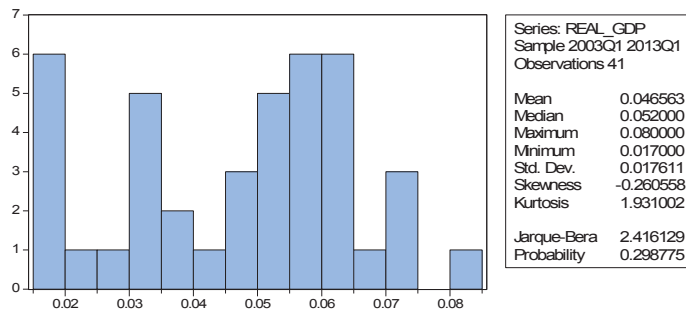
1. Real GDP tends to decrease nonperforming loans tend to increase.
2. Unemployment tends to increase and nonperforming loans tend to increase too.
3. Inflation tends to decrease while nonperforming loans tend to increase
4. Loan interest rate tends to decrease while nonperforming loans tend to increase
5. Remittances tend to decrease while non performing loans tend increase.

**Graph 3.** Histogram and statistics of nonperforming loans series



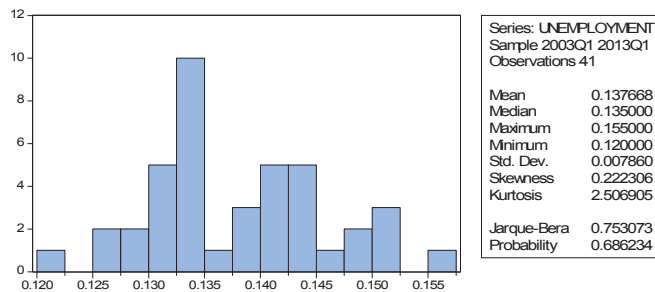
For nonperforming loans Skewness is equal to 0.797893 which is near to 0 and a Kurtosis is equal 2.143471 which is equal to 3 meaning that nonperforming loans have a normal distribution.

**Graph 4.** Histogram and statistics of real GDP series



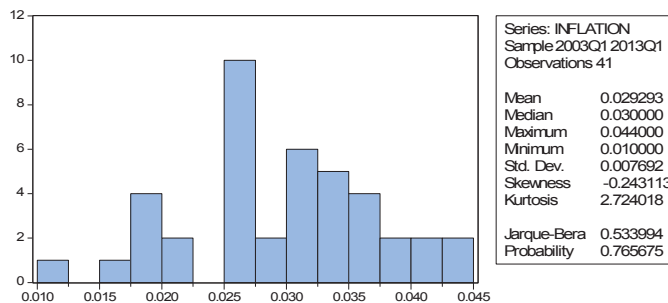
For real GDP Skewness is equal to -0.260558 which is near to 0 and Kurtosis is equal to 2.416129 which is near to 3 meaning that real GDP has a normal distribution.

**Graph 5.** Histogram and statistics of unemployment series



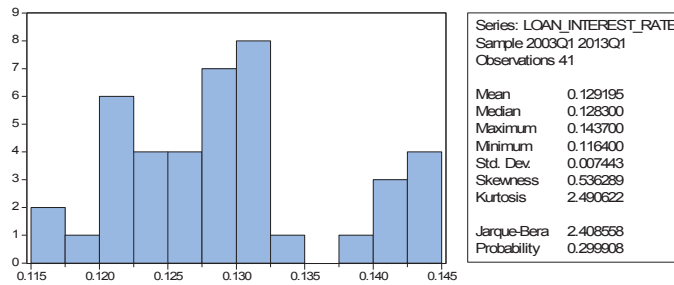
For unemployment Skewness is equal to 0.222306 which is near 0 and Kurtosis is equal to 2.506905 which is near 3 meaning that unemployment has a normal distribution.

**Graph 6.** Histogram and statistics of inflation series



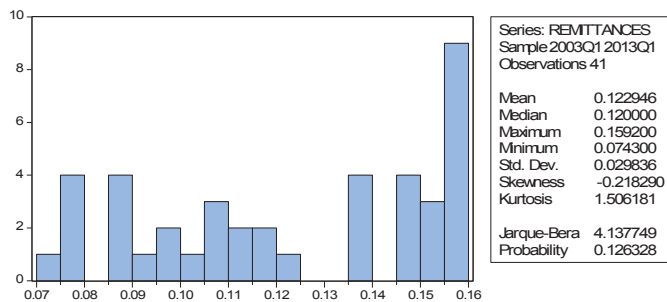
For inflation Skewness is equal to -0.243113 which is near to 0 and Kurtosis is equal to 2.724018 which is near to 3 meaning that inflation has a normal distribution.

**Graph 7.** Histogram and statistics of loan interest rate series



For loan interest rate Skewness is 0.536289 which is equal to 0 and Kurtosis is equal to 2.490622 which is near to 3 meaning that loan interest rate has a normal distribution.

**Graph 8.** Histogram and statistics of remittances series



For remittance Skewness is equal to -0.218290 which is near to 0 and Kurtosis is equal to 1.506181 near 3 meaning that remittance has a normal distribution.

**Table.1** Descriptive statistics of all variables

	NPL	REAL_GDP	UNEMPLOYMENT	INFLATION	LOAN_INTEREST_RATE	REMITTANCES
Mean	0.092846	0.046563	0.137668	0.029293	0.129195	0.122946
Median	0.065000	0.052000	0.135000	0.030000	0.128300	0.120000
Maximum	0.230000	0.080000	0.155000	0.044000	0.143700	0.159200
Minimum	0.020000	0.017000	0.120000	0.010000	0.116400	0.074300
Std. Dev.	0.071516	0.017611	0.007860	0.007692	0.007443	0.029836
Skewness	0.797893	-0.260558	0.222306	-0.243113	0.536289	-0.218290
Kurtosis	2.143471	1.931002	2.506905	2.724018	2.490622	1.506181
Jarque-Bera	5.603634	2.416129	0.753073	0.533994	2.408558	4.137749
Probability	0.060700	0.298775	0.686234	0.765675	0.299908	0.126328
Sum	3.806700	1.909100	5.644400	1.201000	5.297000	5.040800
Sum Sq. Dev.	0.204583	0.012406	0.002471	0.002366	0.002216	0.035607
Observations	41	41	41	41	41	41

Table.1 shows the group statistic where for each variable is made the same analysis as in the series statistics(mean, median, maximum, minimum, Std.Dev, Skewness, kurtosis, Jarqua-Bera, probability, sum, sum Sq. Dev) and again is

seen that all variables are normally distributed.

**Table.2:** Estimated Equation Output

Sample: 2003Q1 2013Q1  
Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.033834	0.055798	0.606370	0.5482
REAL_GDP	-0.772011	0.253977	-3.039689	0.0045
UNEMPLOYMENT	3.841085	0.383110	10.02607	0.0000
INFLATION	-0.246298	0.261159	-0.943094	0.3521
LOAN_INTEREST_RATE	-0.911462	0.339569	-2.684176	0.0110
REMITTANCES	-2.512194	0.154053	-16.30734	0.0000
R-squared	0.975041	Mean dependent var		0.092846
Adjusted R-squared	0.971475	S.D. dependent var		0.071516
S.E. of regression	0.012079	Akaike info criterion		-5.860315
Sum squared resid	0.005106	Schwarz criterion		-5.609548
Log likelihood	126.1365	Hannan-Quinn criter.		-5.769000
F-statistic	273.4605	Durbin-Watson stat		0.741452
Prob(F-statistic)	0.000000			

In the table is noticed that when:

- Real GDP increases by 1 unit NPL decreases 0.77 unit
- Unemployment increases by 1 unit NPL increases 3.84 unit
- Inflation increases by 1 unit NPL decreases by 0.25 unit
- Loan interest rate increases by 1 unit, NPL decreases 0.91 unit
- Remittances increases by 1 unit, NPL decreases by 2.51 unit.

From these results is seen that there exist a negative relationship between non performing loans and inflation and also a negative relationship between nonperforming loans and loan interest rate. These results are against the international results from which is concluded that there exists a positive relationship between nonperforming loans and these other two variables (inflation, loan interest rate).

As the equation was  $NPL = B_0 + B_1GDP + B_2UN + B_3INF + B_4INT + B_5RE + U$

by substituting the values is achieved the final equation:

$$NPL = 0.033834 - 0.772011GDP + 3.841085UN - 0.246298INF - 0.911462INT - 2.512194RE$$

**Table.3:** Augmented Dickey Fuller Unit Root Test on NPL, real GDP, unemployment, inflation, loan interest rate, remittances

Variables	1% level	5% level	10% level	Probability
NPL	-3.610453	-2.938987	-2.607932	0.9992
Real GDP	-3.610453	-2.938987	-2.607932	0.8075
Unemployment	-3.610453	-2.938987	-2.607932	0.2763
Inflation	-3.610453	-2.938987	-2.607932	0.0219
Loan interest rate	-3.610453	-2.938987	-2.607932	0.0565
Remittances	-3.610453	-2.938987	-2.607932	0.985

**Table.4:** Augmented Dickey Fuller Unit Root Test on D(NPL, real GDP, unemployment, inflation, loan interest rate, remittances )

Variables	1% level	5% level	10% level	Probability
D(NPL)	-2.625606	-1.949609	-1.611593	0.0000
D(Real GDP)	-2.625606	-1.949609	-1.611593	0.0005
D(Unemployment)	2.625606	1.949609	-1.611593	0
D(Loan interest rate)	-2.625606	-1.949609	-1.611593	0.0000
D(Remittances)	-2.625606	-1.949609	1.611593	0.0001

All the variables are analyzed if they have a unit root or not so if they are non stationary or stationary or in other words if they are integrated in the same order. From the results of Augmented Dickey Fuller Unit Root Test as it is seen in the table all the variables except inflation have a unit root so they are non stationary because the value of probability is greater than 0.05 but when first differenced they become stationary their probabilities are lower than 0.05.

After converting non stationary variables into stationary ones it is applied Johansen co-integration test to see whether these variables are co-integrated in the long run.

**Table.5** Johansen co-integration test

Series: NPL REAL\_GDP UNEMPLOYMENT INFLATION LOAN\_INTEREST\_RATE REMITTANCES  
Lags interval (in first differences): 1 to 2  
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.591094	117.6240	95.75366	0.0007
At most 1 *	0.514157	83.64178	69.81889	0.0027
At most 2 *	0.450358	56.21076	47.85613	0.0068
At most 3 *	0.395210	33.46822	29.79707	0.0181
At most 4	0.240533	14.35898	15.49471	0.0736
At most 5 *	0.097629	3.903741	3.841466	0.0482

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.591094	33.98226	40.07757	0.2068
At most 1	0.514157	27.43102	33.87687	0.2410
At most 2	0.450358	22.74254	27.58434	0.1847
At most 3	0.395210	19.10924	21.13162	0.0937
At most 4	0.240533	10.45523	14.26460	0.1837
At most 5 *	0.097629	3.903741	3.841466	0.0482

Max-eigenvalue test indicates no cointegration at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

In Table 5, Trace test indicates 4 co-integrating equations at the 0.05 level where the Trace statistic is greater than 5% critical value while Max-Eigen value test indicates that there is no co-integration at 0.05 level because Max-Eigen statistic



is lower than 5% critical value. In other words nonperforming loans and the other five variables: real GDP, unemployment, inflation, loan interest rate, remittances are co-integrated to each other but in the long run this co-integration is weak.

## 5. Conclusions

Albanian banking system is facing many challenges. The problems caused by economic crisis, the decrease of incomes coming from emigrants and the fact that banks were not careful on giving loans in the first years of transition have caused a continuous increase of nonperforming loans. In this situation an analysis of the micro and macroeconomic environmental factors where banks operate must be done. There are five economic variables taken in consideration in this paper as main economic variables affecting the level of nonperforming loans and they are: real GDP, unemployment, inflation, loan interest rate and remittances. From what it is concluded from the results of Johansen co-integration nonperforming loans and the other five variables: real GDP, unemployment, inflation, loan interest rate, remittances are co-integrated to each other but in the long run this co-integration is weak.

It is important to pay more attention to this situation because when nonperforming loans increase the whole economic stability of the country is being endangered so regulators must take some fiscal and monetary measures to improve it. Even though the Albanian banking system has made a progress compared to the first years of transition there are still some other things that need to be done.

For the improvement of the situation there are some measures that can be taken:

- Start to develop a tighter loan monitoring process. Banks must be more careful than they are now when giving new loans because in this way they can improve their loans portfolio step by step.
- Lending smaller loans than larger ones.
- For large clients accept financial statements that are audited from reputable companies.
- Offer training to loan officers continuously.

## References

- Abdelkader Boundriga, Neila Boulila Taktak and Sana Jellouli (2014) "Does bank supervision impact nonperforming loans: cross-country determinants using aggregate data?", [http://www.researchgate.net/publication/38309279\\_Does\\_bank\\_supervision\\_impact\\_nonperforming\\_loans\\_cross-country\\_determinants\\_using\\_aggregate\\_data](http://www.researchgate.net/publication/38309279_Does_bank_supervision_impact_nonperforming_loans_cross-country_determinants_using_aggregate_data)
- Bank of Albania quarterly reports for 2003
- Bank of Albania quarterly reports for 2004
- Bank of Albania quarterly reports of 2005
- Bank of Albania quarterly reports of 2006
- Bank of Albania quarterly reports of 2007
- Bank of Albania quarterly reports of 2008
- Bank of Albania quarterly reports of 2009
- Bank of Albania quarterly reports of 2010
- Bank of Albania quarterly reports of 2011
- Bank of Albania quarterly reports of 2012
- Bank of Albania quarterly reports of 2013
- Bruna Skarica (2013) "Determinants of nonperforming loans in Central and Eastern European countries", <http://fintp.ijf.hr/upload/files/ftp/2014/1/skarica.pdf>
- Carlos Andres and Olaya Bonilla (2012), "Macroeconomic determinants of Nonperforming Loans in Spain and Italy", [http://www.banrepcultural.org/sites/default/files/tesis\\_olaya\\_carlos.pdf](http://www.banrepcultural.org/sites/default/files/tesis_olaya_carlos.pdf)
- Dimitrios Angelos and Vasilios (2011), "Macroeconomic and bank specific determinants of nonperforming loans in Greece: a comparative study of mortgage business and consumer loan portfolios", <http://www.bankofgreece.gr/BogEkdoseis/Paper2010118.pdf>
- Evelyn Richard (2011), "Factors that cause Nonperforming Loans in Commercial Banks in Tanzania and Strategies to Resolve Them", [http://www.na-businesspress.com/JMPP/RichardE\\_Web12\\_7\\_.pdf](http://www.na-businesspress.com/JMPP/RichardE_Web12_7_.pdf)
- Fawad Ahmad (2013), "Corruption and Information Sharing as Determinants of Nonperforming Loans", Business System Research, Vol.4, No.1, pp.87-98
- Iuga and Ruxandra Lazea (2012), "The influence of unemployment rate over nonperforming loans in Romania using the correlation indicator", <http://oeconomica.uab.ro/upload/lucrari/1420122/18.pdf>
- Iva Gjergji, (2013), "An analysis of nonperforming loans in the Albanian banking system", <http://www.ijbcnet.com/2-6/IJBC-13-2602.pdf>
- Kipyego Daniel Kwambai and Moses Wandera, (2013), "Effects of credit information sharing on nonperforming loans: case of Kenya", <http://www.ejournal.org/index.php/esj/article/view/1048>
- Krishna Prasanna (2014), "Determinants of Nonperforming Loans in Indian Banking System", <http://psrcentre.org/images/>

extraimages/214306.pdf

- Linbo Fan and Sherill Shafer (2004), "Efficiency versus risk in large domestic US banks", *Managerial Finance*, Vol. 30 Iss: 9, pp.1 - 19
- Mohd Zain Abd Karim, Sok-Gee Chan, Sallahudin Hassan (2010), "Bank Efficiency and Nonperforming Loans: Evidence from Malaysia and Singapore", [http://www.researchgate.net/publication/46560594\\_Bank\\_Efficiency\\_And\\_Non-Performing\\_Loans\\_Evidence\\_From\\_Malaysia\\_And\\_Singapore](http://www.researchgate.net/publication/46560594_Bank_Efficiency_And_Non-Performing_Loans_Evidence_From_Malaysia_And_Singapore)
- Munib Badar and Atiya Yasmin Javid, (2013), "Impact of macroeconomic forces on nonperforming loans in Pakistan", <http://www.wseas.org/multimedia/journals/economics/2013/56-259.pdf>
- Mwanza Nkusu, (2011), "Nonperforming loans and macrofinancial vulnerabilities in advanced economy", <http://www.imf.org/external/pubs/ft/wp/2011/wp11161.pdf>
- Nir Klein, (2013), "Nonperforming loans in CESEE: Determinants and Impact of Macroeconomic Performance", [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2247224](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2247224)
- Roland Beck, Petr Jakubik and Anamaria Piloiu (2013), "Nonperforming loans: What matters in addition to the economic cycle?", [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2214971](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2214971)

## Appendix

Years	NPL	Real GDP	Unemployment	Inflation	Loan interest rate	Remittance
2003Q1	4.80%	8%	15.50%	1.80%	14.37%	15.92%
2003Q2	4.60%	7.30%	15.20%	3.50%	14.29%	15.72%
2003Q3	4.50%	7%	15%	4.00%	14.27%	15.72%
2003Q4	4.40%	7%	15%	4.10%	14.15%	15.62%
2004Q1	4.30%	6.50%	14.90%	3.50%	12.11%	15.61%
2004Q2	4.30%	6%	14.80%	3.30%	11.88%	15.57%
2004Q3	4.20%	5.60%	14.60%	3.30%	11.72%	15.55%
2004Q4	3.85%	5.60%	14.40%	3.00%	11.64%	15.55%
2005Q1	2.50%	5.60%	14.40%	3%	13.11%	15.50%
2005Q2	2.40%	5.50%	14.30%	3%	13.10%	15.40%
2005Q3	2.30%	5.43%	14.20%	3%	13%	15.39%
2005Q4	2.00%	5.33%	14.20%	3%	13.05%	15.39%
2006Q1	3%	5.20%	14%	3%	13%	14.99%
2006Q2	3.10%	4.97%	13.90%	3%	12.94%	14.97%
2006Q3	3.10%	4.95%	13.80%	3%	13%	14.89%
2006Q4	3.20%	4.80%	13.80%	3%	13.00%	14.66%
2007Q1	3.30%	5%	14%	3%	13.98%	13.99%
2007Q2	3.39%	5.97%	14.20%	2%	14%	13.71%
2007Q3	3.40%	6%	14.30%	3.60%	14.10%	13.71%
2007Q4	3.41%	6.10%	14.30%	3%	14.30%	13.65%
2008Q1	6.50%	6.10%	13.50%	4.40%	13.33%	12%
2008Q2	6.58%	6.31%	13.40%	3.50%	13.05%	11.53%
2008Q3	6.70%	6.20%	13.20%	2.70%	13.03%	11.50%
2008Q4	6.80%	5.74%	12%	2.70%	13.00%	11.30%
2009Q1	9%	5.46%	12.68%	1.80%	12.86%	11.00%
2009Q2	10%	4%	12.70%	1.90%	12.66%	10.90%
2009Q3	11%	3.30%	12.76%	2.00%	12.59%	10.88%
2009Q4	11.50%	3%	12.80%	3.00%	12.77%	10.65%
2010Q1	12.50%	3.20%	13.00%	3.90%	12.80%	10.31%
2010Q2	13.39%	3.37%	13.10%	3.20%	12.82%	9.75%
2010Q3	14%	3.55%	13.20%	3.40%	12.83%	9.60%
2010Q4	14.50%	3.55%	13.20%	3.40%	12.60%	9.30%
2011Q1	17.88%	3.15%	13.30%	4.30%	12.47%	8.88%
2011Q2	18%	2.77%	13.30%	3.90%	12.40%	8.86%
2011Q3	19.50%	2.13%	13.30%	2.70%	12.30%	8.86%
2011Q4	20%	1.93%	13.31%	1.70%	12.25%	8.84%
2012Q1	21.50%	1.93%	13.32%	1.00%	12.23%	7.80%
2012Q2	23%	1.90%	13.35%	2.20%	12.23%	7.79%
2012Q3	22.78%	1.89%	13.39%	2.60%	12.22%	7.79%
2012Q4	22.99%	1.88%	13.40%	2.50%	12.22%	7.60%
2013Q1	23%	1.70%	13.40%	3%	12.21%	7.43%