Turkish Online Journal of Qualitative Inquiry (TOJQI)
Volume 12, Issue 8, July 2021: 2406 – 2414

How Does the Interest Rate Impact the Bank Loans in the Albanian Economy?

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Abstract

Positive or negative changes in interest rates and their correlation with consumption and in general with the well-being of households is a very current topic and equally important for the economy of a country which have a direct impact on its development. Interest rates are one of the most important channels of monetary policy transmission. The operation of this transmission channel depends heavily on the macroeconomic conditions and financial structures of the country.The main problem lies in the high interest rate margins due to many factors such as: informal economy, inability of Central Banks to inject liquidity, weaknesses in the quality of financial reporting of businesses, non-performing loans, etc. High level of margin of interest interest rates is an indicator of inefficiency, excessive risk taking and lack of competition.

This paper aims to analyze the relationship between the interest rate of bank loans and some macroeconomic and banking factors by using a multiple linear regression where the interest rate of bank loans is taken as a dependent variable. The model is constructed using the method of least squares, for three-month time series for the period 2005-2020. The final model, regardless of the breakpoints, expresses the fair relationship between the credit rate and the deposit rate, as well as the oblique relationship of the explanatory variable with imports and the unemployment rate. The final model, taking into account the breakpoints, expresses the fair relationship between the credit rate and the deposit rate, as well as the backward relationship to imports. As the change in the interest rate may change the market value of bank assets and liabilities in various amounts, banks need to carefully review interest rates and not be interested only in earnings.

Keywords: Albania, Bank Loans, Interest Rate, Monetary Policy, Multiple Linear Regression.

1. Introduction

Credit rate is one of the ways in which a bank or lender generates income, so the credit rate is closely linked to the loan **(Jareno, F., Ferrer, R. and Miroslavova, 2016)**. When interest rates fall, borrowing becomes more attractive/tempting. When there are low interest rates in the banking market, consumers find it easier to buy a car or a home **(Saunders, A. and Cornet, M., 2010)**. Buying a home increases demand for other goods such as furniture, electrical appliances, thus giving a boost to economic growth **(Khuarshid, A. and Suyuan, L.W., 2015)**. Moreover, consumers spend less on interest costs, enabling them to have more money to spend on goods and services **(Dore, M., Makken, R., and Eastman, E., 2013)**. Also, when interest rates are low, farmers, producers and other businesses find it easier to borrow to invest in buying various machinery and building new premises(Obamuy, 2009). Moreover, the profits that these businesses bring in the future are more valuable when interest rates are low than when they are high (Olugbode, M., El-Masry, A. and Pointon, J., 2014). This encourages businesses to invest, at a time when interest rates are low. As a consequence, investment growth gives rise to higher economy (Friedman, B. and Kuttner, K., 2010). The amount of interest to be paid depends on several factors: the principal amount borrowed or loaned, the duration of the loan received, the annual interest rate, the loan repayment schedule and the way of calculating the interest (Reilly, F.K., Wright, D.J. and Johnson, R.R., 2007).

2.Significance Of The Study

In today's modern banking language, people talk about interest rates, which they see as linked to a range of financial or economic decisions they have to make. Well, through them the central banks manage to be an important factor in the life

of everyone and that of society in general. Interest rates have the power to affect people's lives: how much people want to save and how much interest different businesses haveto invest? Influencing economic decisions that different personsundertake, they serve as a determining factor for investment in the overall level of the economy. When the interest rates decrease, investments increase, as a result of lower borrowing costs. In this case, people rush to buy a house, a car, and thus they feel more optimistic about the future. Although people have such a relationship with interest rates, they do not always have the right knowledge about what they represent, or how different rates are related to each other. Interest rates and their determinants are a global debate. They represent a phenomenon that is worth studying for many reasons. The significance of this research is to identify the factors that affect the interest rate margins, in order to understand why the problem of high interest rates lies.

3. Review Of Related Studies

Many scholars draw different conclusions about the relationship between interest rate and investment according to a large number of empirical analyzes**(Uddin, K. and Saima, U., 2015)**. If investment is added as an endogenous variable to a model of monetary service function, the result turned out that investment really has a certain impact on interest rates **(Alvarez, Luis H.R., 2010)**. If the discount rate was replaced by the stochastic interest rate in a real option, the result showed that interest rate uncertainty had a noticeable effect on investment **(Alaganar, V. T., and Bhar, R., 2003)**. The analysis of irreversible investments below the rates of change showed that the change in the rate had a positive or negative impact on the investment demand **(Brock, P. L., and Suarez, L. R., 2000)**. The short-term rate allocation model showed that the uncertainty of the rate may limit the investment and the enterprise's degree **(Walsh, L., 2010)**.

Crowley(2007)reviewed the interest rate determinants using the US example in the period 1976-1979. It turns out that interest rate margins are affected by the lack of management of fear of risk, the size of the transaction, the degree of market competition and the variability of the interest rate.The interest rate movement is a major concern for all financial institutions and markets. It influences the decision-making, performance and growth of each particular institution **(Ballester, L., Ferrer, R. and González, C., 2011)**. Changes in interest rates and interest rate expectations affect the revenues and expenditures of these institutions. Under normal circumstances, the average yield of the active broker (credit) will exceed the rate that the savers pay to attract funds. In fact, a positive net interest margin should exist over a long-term period for a financial institution to remain in the business of borrowing and lending. But maintaining a positive net interest margin over time has been a particular problem for a number of financial institutions in recent years due to volatile interest rates and other factors such as restrictive regulations, unmanaged management, etc.. **(Verma, P. and Jackson, D., 2008)**.

Beccarini (2007)conducts a study to find out what promotes lending interest rates, using data from the Microfinance Institution from Asia, Africa and America with 1299 institutions for the period 2000-2008 and using a variety of equations, he found that the interest rate is negatively related to the productivity of the institutions and has a positive relationship to the financing costs.Some scholars believe that interest rates can not have an impact on investment **(Ferrando, L., Ferrer, R. and Jareno, F., 2016)**. VAR model was used to test the causal link between interest rates and investments, and found this investment depends on the level of demand in the macroeconomic, rather than interest rates **(Czaja, M., Scholz, H. and Wilkens, M., 2009)**. According to the analysis of three rate increases from 1960 to 1978 in West Germany, this effect of interest rate on investment varies in two periods due to the policy of change **(Dore, M., Makken, R., and Eastman, E., 2013)**.In the field of microeconomics, the impulse response is used to analyze the effect of the policy of investor rates. Based on interest rates data, 2002-2010, the result showed that investors could not cope with the impact of interest rates in the short term **(Campion, A., Rashmi, K., Wenner, M., 2010)**.

4.Objectives Of The Study

This objective of the study is to analyze the relationship between the interest rate of bank loans and some macroeconomic and banking factors, as deposit rate, unemployment rate and imports.

5. Methodology

The credit rate is influenced by many economic factors, such as investments and consumption as demand sources that promote interest rate change. Other factors could be the expected inflation, economic conditions and monetary policy. For the selection of explanatory variables, it was initially started with a simple regression to choose a variable that best explains the credit rate, this variable in our case is the deposit rate. After that, the Omitted Variables Test was used to add

other important variables. The final model, if the breaking points are ignored, contains these explanatory variables: deposit rate, unemployment rate and imports. While the two subperiod models do not contain the unemployment rate variable. Both end models are log-log, so the variables are all under logarithm.

In the test for the addition of other important variables, the variables that were tested are GDP, inflation rate, exchange rate with euro currency, exports, trade balance, economic growth, foreign direct investment, etc., but these variables were insignificant. It should be noted that the main sources of statistical data are Bank of Albania, INSTAT, EUROSTAT and TradingEconomics. The simple arithmetic average is used to adjust the monthly data in a three-month period.

6. Analysis Of The Results

Stationarity Test - The selected series are four: Credit Rate (log (NK)), Deposit Rate (log (ND)), Unemployment Rate (log (PAP)) and Imports (log (IMP)). For these series, unitary root test was performed according to Augmented Dickey-Fuller and the results are as follow. First, let's look at the unit roots test for the log series (NK):

Table 1: ADF test for the stationarity of the credit rate - log (NK)

Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.279506	0.1829
Test critical values:	5% level	-1.946549	

Source: Author Calculations

As can be seen from the test results, the p-value is 0.1829, greater than the importance level of 0.05, which means that the null hypothesis: NK series has a unit root (non-stationary series), will be accepted. So, the NK-credit rate series is non-stationary. It turns stationary with a margin. This is shown below in Table 2, where the p-value is zero, which means that the nullhypothesis is rejected for the significance level $\alpha = 5\%$.

Table 2: ADF test for NK series with first margin

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.074552	0.0000
Test critical values:	5% level	-1.946654	

Source: Author Calculations

The same test is followed for all series in the model. The table below summarizes the ADF test results for stationarity.

Table 3: Summary of the ADF test on all series

Series	Statistics t -ADF	p-value	Stationarity	Level
log(NK)	-1.279506	0.1829	Non-stationary	I(1)
log(ND)	-1.567872	0.1091	Non-stationary	I(1)
log(IMP)	1.820559	0.9824	Non-stationary	I(1)
log(PAP)	-0.296765	0.5745	Non-stationary	I(1)

Source: Author Calculations

Estimated regression model - After multiple tests, three independent variables and functional log-logs were chosen. This selection of the functional form was made to supplement the condition of the functional form of the model, based on the Ramsey RESET test. Results of the estimated regression model are given below:

Table 4: Model evaluation results

Dependent Variable: LOG(NK)

Method: Least Squares

Sample: 3/01/2005 9/09/2020

Included observations: 59

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.463231	0.549971	9.933671	0.0000
LOG(ND)	0.221352	0.025495	8.682142	0.0000
LOG(IMP)	-0.188582	0.033716	-5.593286	0.0000
LOG(PAP)	-0.502073	0.106888	-4.697205	0.0000

R-squared	0.895990	Mean dependent var	2.464273
Adjusted R-squared	0.890316	S.D. dependent var	0.215359
S.E. of regression	0.071324	Akaike info criterion	-2.377784
Sum squared resid	0.279790	Schwarz criterion	-2.236934
Log likelihood	74.14462	Hannan-Quinn criter.	-2.322802
F-statistic	157.9313	Durbin-Watson stat	0.914491
Prob(F-statistic)	0.000000		

Source: Author Calculations

The estimated regression function is:

$$\mathbf{log(NK) = 5.46 + 0.22 * log(ND) - 0.189 * log(IMP) - 0.5 * log(PAP)}$$

As it is noticed, the model is globally important, with a high Fisher value and probability close to zero. All coefficients are important with high values of student statistics, compared to the absolute (absolute) value. Explanatory variables explain about 89% of the total credit rate variation, which is a relatively high value. It is worthwhile to interpret the partial coefficients of the model:

β_0 = 5.46 - when all the explanatory variables are zero, the credit rate is 5.46.

β_1 = 12.22 - if its keeped the imports and the unemployment rate constant, this mean that when the deposit rates increase by 1% then the credit rate increases by 0.22%.

β_2 = -0.189 - if its keeped the deposit rate constant and the unemployment rate, this mean that when imports increase by 1% then the credit rate drops by 0.189%.

β_3 = -0.5 - if its keeped the deposit rate constant and imports, this mean that when unemployment increases by 1% then the credit rate drops by 0.5%.

Testing the functional form - To test whether the selected functional form is appropriate or not, it is performed the Ramsey RESET test. As its known, this test is good to show if the form is appropriate, but it does not indicate what would be the appropriate form if the H_0: The appropriate functional form falls down. Seen from the results of this test, for the two added variables (the second and third variables of the dependent variables):

Table 5: Ramsey test for the suitability of functional form

Ramsey RESET Test

Equation: UNTITLED

Specification: LOG(NK) C LOG(ND) LOG(IMP) LOG(PAP)

Omitted Variables: Powers of fitted values from 2 to 3

	Value	df	Probability
F-statistic	2.894763	(2, 53)	0.0641
Likelihood ratio	6.116635	2	0.0470

Source: Author Calculations

In the first steps of building this model, it was considered its linear form, but the functional forms were not appropriate. For this reason, the log-log form was chosen, which, as seen in Table 5, is an appropriate functional form since $p = 0.0641 > \alpha = 0.05$.

Testing the model for the presence of Heteroskedasticity - Heteroskedasticity is one of the problems that may have a regression function. This problem is related to waste and the assumption of constant variances of waste, in the MZKV method. If the residues have a non-constant variance σ_i, then the assumption of the residuals with constant variance falls below and the model evaluation method will be called MPKV (Generic Metered Method of Smaller Squares).

Table 6: Heteroskedasticity Testing by White

Heteroskedasticity Test: White

F-statistic	2.454029	Prob. F(9,49)	0.0215
Obs*R-squared	18.33110	Prob. Chi-Square(9)	0.0315
Scaled explained SS	21.61260	Prob. Chi-Square(9)	0.0102

Source: Author Calculations

It was found that the p-value is 0.0215, lower than the 5% significance level, which means that the null hypothesis raised above falls. So, this model suffers from heteroskedasticity. What its expected from the regulation of this model is a different student values, for the explanatory variables of our function. It was made the weighting according to White, with the standard deviation inversion, to bring the variances in real terms and gain the following pattern:

Table 7: Model evaluated with MPKV after elimination of Heteroskedasticity

Dependent Variable: LOG(NK)

Method: Least Squares

Sample: 3/01/2005 9/09/2020

Included observations: 59

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	5.463231	0.510289	10.70615	0.0000
LOG(ND)	0.221352	0.021842	10.13417	0.0000
LOG(IMP)	-0.188582	0.037355	-5.048316	0.0000
LOG(PAP)	-0.502073	0.082460	-6.088722	0.0000

R-squared	0.895990	Mean dependent var	2.464273
Adjusted R-squared	0.890316	S.D. dependent var	0.215359
S.E. of regression	0.071324	Akaike info criterion	-2.377784
Sum squared resid	0.279790	Schwarz criterion	-2.236934
Log likelihood	74.14462	Hannan-Quinn criter.	-2.322802
F-statistic	157.9313	Durbin-Watson stat	0.914491
Prob(F-statistic)	0.000000	Wald F-statistic	258.8882
Prob(Wald F-statistic)	0.000000		

Source: Author Calculations

After eliminating heteroskedasticity, it was seen that the pattern and partial coefficients continue to be important.Those that have changed are just the student's values for the coefficients.

Testing the Model for the presence of Autocorrelation - Autocorrelation is a problem of dynamic data, ie time series, which indicates the existence of a correlation between model waste, which contradicts the assumption of MZKV that residues have a zero covariance among them. It was conducted the Serial Correlation LM Test - BG test with two time lags to see if this model suffers from Autocorrelation.

H_0: The model does not suffer from Autocorrelation

H_1: The model suffers from Autocorrelation

Table 8: BG test for autocorrelation detection

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	11.31173	Prob. F(2,53)	0.0001
Obs*R-squared	17.65039	Prob. Chi-Square(2)	0.0001

Source: Author Calculations

From the results of the BG test for the presence of Autocorrelation, it was seen a p-value close to zero, that is less than the 5% significance level. This means that the null hypothesis falls down, so, the model suffers from Autocorrelation (there is at least AR (1)). Let's see if the model has only AR (1) or AR (2). It is concluded from the tests that the model has only AR (1) and its presence in the model will change the model results as in Table 9.

Table 9: Regression function after addition of AR (1)

Dependent Variable: LOG(NK)

Method: Least Squares

Sample (adjusted): 6/01/2005 9/09/2020

Included observations: 58 after adjustments

Convergence achieved after 12 iterations

White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.504678	0.757134	5.949642	0.0000
LOG(ND)	0.250041	0.030902	8.091387	0.0000
LOG(IMP)	-0.159295	0.052601	-3.028354	0.0038
LOG(PAP)	-0.272341	0.133500	-2.040015	0.0463
AR(1)	0.600295	0.118641	5.059773	0.0000

R-squared	0.927797	Mean dependent var	2.461048
Adjusted R-squared	0.922347	S.D. dependent var	0.215798
S.E. of regression	0.060135	Akaike info criterion	-2.702198
Sum squared resid	0.191657	Schwarz criterion	-2.524573
Log likelihood	83.36374	Hannan-Quinn criter.	-2.633010
F-statistic	170.2597	Durbin-Watson stat	1.871435
Prob(F-statistic)	0.000000	Wald F-statistic	50.82784
Prob(Wald F-statistic)	0.000000		

Inverted AR Roots	.60

Source: Author Calculations

From Table 9, it is noted that the model estimates have changed and their importance as well. Although all explanatory variables are still important, the significance of the log variable (PAP) has dropped significantly after inclusion in the AR model (1). The model continues to be globally important. The fact that the model no longer suffers from Autocorrelation is also noted in the Durbin Watson statistic value near the value 2. The new model has an explanation of about 92.2% of the variables dependent on independent variables.

7.Conclusions and Recommendations

The final model, regardless of the breakpoints, expresses the fair relationship between the credit rate and the deposit rate, as well as the oblique relationship of the explanatory variable with imports and the unemployment rate. The final model, taking into account the breakpoints, expresses the fair relationship between the credit rate and the deposit rate, as well as the backward relationship to imports.In the model where the breakpoint is taken into account, it has a higher explanation of the credit rate. Consequently, the model based on two sub-periods is the model that should be considered for further forecasts. A positive correlation has been established between interest rates and deposit rates over the 3-month period. So, with the growth of deposit rates, the interest rates are rising rather than the same.

An increase in imports and unemployment decreases lending interest rates. These research findings confirm the results of previous researches on correlation of variables and interest rate trends, given that the correlation strength varies in two directions: observation periods and the procedures used.Interest rate risk remains one of the most important risks by which a bank is exposed because a good part of the income comes as a difference between the asset's items and the bank's balance sheet liability.The Bank of Albania easing monetary policy in recent years, through a drop in the key interest rate of 1.75%, which has shifted to falling interest rates on deposits, has "slipped" the depositors, causing deposit growth to slow down sharply.

As the change in the interest rate may change the market value of bank assets and liabilities in various amounts, banks need to carefully review interest rates and not be interested only in earnings.The difficulty of receiving a loan depends more on the cost, mostly from the interest rate on borrowed funds. Albanian youth are steadfast in obtaining a loan and generally in relation to housing loans, since this is also related with job difficulties. Therefore banks should look at interest rates on categorized loans. The risk of exchange rate fluctuations affects the bank, as a change in the exchange rate may reduce the solvency of the borrower.

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