"MARKET DETERMINANTS OF INTEREST RATE SPREADS IN THE ALBANIAN BANKING SYSTEM''

Ömer EROĞLU*
Miranda ÇITOZI (KAÇANI)**

Abstract

This project analysis the interest rates spread in the banking system in Albania. It presents some literature review on interest rates spreads of the banking system then it goes into empirical analysis of the analysis in banking system in Albania. For the preparation of the paper a lot of available data for the market and analysis has been done. Mainly, the data are gathered from the publishing of the Albanian Central Bank and international financial organizations like World Bank & IMF. Moreover, the analysis is supported with personal knowledge and suggestions about the subject.

Keywords: Albania, Albanian Banking System, Interest Rate,

* **Prof. Dr. Ph.D,** Epoka University, Department of Economics, Tirana/Albania oeroglu@epoka.edu.al

** **MBA,** Epoka University, Department of Banking and Finance, Tirana/Albania mkacani@bkt.com.al

I. Introduction

The aim of this study is to understand the market determinants of interest rate spreads in Albanian banking system. Despite the full privatization and long experienced foreign banks being present in Albania, the banking sector is still characterized by persistently high interest rate spreads. According to Sologoub,(2006:2), it is stated that interest rate spreads are accepted as an sufficient measure of banking efficiency. On that sense, quantitative analysis of the determinants of banking sector interest rate spreads in Albania is very important. Having the individual; data from each commercial bank was difficult. But in order to overcome that we have considered the consolidated market data as published by the Central Bank of Albania.

II. Literature review

As financial intermediaries, efficient banking sector is an important factor in economic development of developing countries. Banking sector efficiency plays significant role in the operation of most economies by effecting mobilization of investible resources. Consequently, it can also affect economic growth rate (Levine, 1996). A major indicator of banking sector efficiency is interest rate spreads (Demirguc-Kunt and Huizinga, 1998; Folawewo and Tennant, 2008:2) bank interest rate spreads are tend to be higher in latin America, Africa than in OECD countries (Randall, 1998; Chirwa and Mlachila, 2004; Crowley, 2007).

Numerous studies have examined the determinants of interest rate spreads by classifying determinants of commercial banks' interest rate spreads according to whether they are bank-specific, industry specific or macroeconomic in nature (Tennant and Folawewo, 2009:5). Some researcher like Demirguc-Kunt and Huizinga, (1998), Moore and Craigwell, (2000) and Sologoub, (2006) indicate that the specific characteristics of commercial banks mostly include the foreign ownership, type of business, the bank size, the quality of the loan portfolio, its costs, operating expenses, and the ratio of liquid and fixed assets. All these studies show that such a specific characteristics of commercial bank has significant effects on commercial banks' net interest margins (Tennant and Folawewo, 2009:5). For example, because of overhead costs and commissions must be covered by banks somewhere in their operations, higher costs may be associated with higher spreads. However, many other studies suggest that individual bank

characteristics are often not highly correlated with interest rate spreads because they are largely determined at the industry level (Brock and Franken, 2002:17).

Many studies argue that unless bank behavior changes, financial liberalization cannot be expected to lead to a significant improvement in the efficiency of the financial system. There are some explanations for limited changes in behavior of banking sector that highinterest rate spreads and inefficiency persist after financial liberalization . Several arguments have been advanced to explain the failure of interest spreads in developing countries to converge towards international levels, suggests that high interest rate spreads in developing countries may persist unless financial sector reforms significantly improve the structure of banking sector and financial liberalization may not be expected to lead a significant improvement in the efficiency of banking system (Chirwa and Mlachila 2002:4-5).

A critical relationship between bank efficiency and economic development have been argued in many study and it is noted that a more efficient banking system contributes the economic development by allowing higher expected return for saver and lower borrowing costs for investing in new project. According to this view, if commercial bank interest rate spreads is high, it distort saving potential and limits financing investment (Quaden, 2004:2). The specific market determinants of commercial bank interest rate spreads include the role of implicit and explicit taxes, lack of adequate competition in the banking sector, thus market power of commercial banks and the determinant of bank cost and profit such as inflation, growth rate, scale economies, the structure of the banking sector. Interest rate spreads tend to fall as institutional factors, such as the efficiency of the legal system, contract enforcement, and decreased levels of corruption, have been improved. Interest rate spreads are also widened by scale diseconomies due to the small size of markets (Folawewo and Tennant, 2008:7; Demirguc-Kunt and Huizinga 1998:2-4;). Moreover, bank interest rate spreads are increased in poorly-developed banking sector and in highly corrupted and inefficient banking system. Legal and institutional differences effect interest rate . The better contract enforcement, efficiency of the legal system and lack of corruption are associated with lower interest margins and lower profitability. (Demirguc-Kunt and Huizinga 1998:6).

Some of the studies of interest rate spread show that Macroeconomic factors explain significant diversification in bank interest rate spreads. According to a Moody's report, macroeconomic

factors influence the variations of credit spreads. But there is no generally approved model to test the consequences of macroeconomic shocks for interest rate spreads. Some model show that a positive shock to income lowers spreads by improving the net worth of borrowers. However in other model, there is an ambiguous effect on interest rate spreads, while either a savings squeeze or a credit boom decreases spreads unambiguously (Brock and Franken, 2003:9).

Chirwa and Mlachila (2002) investigate the impact of financial sector reforms on interest rate spreads in the commercial banking system, because financial reforms have been a major component of structural adjustment programs in developing countries. In their study, they used alternative definitions of spreads, and found that spreads increased significantly after financial liberalization, and assert that the observed high spreads can be attributed to high monopoly power, high reserve requirements, high central bank discount rate and high inflation. Macroeconomic instability with the policy environment has important impacts on the pricing behavior of commercial banks. They stated that the macroeconomic variables, such as inflation rate, growth rate of output, and real interest rates, are determinants of interest rate spreads.

Banking system is an important factor in economic development. Despite the cost of financial intermediation plays a crucial role in financial development, it is a more disputed topic. Brock and Franken (2002:3-5) included interest rate uncertainty and exchange rate volatility loans in the list of determinants of spreads and found that measures of volatility (risk) affect margins based on bank balance sheet data and spreads based on interest rate data in the same way. They suggest that different margins and spreads provide complementary empirical points of departure that can explain the behavior of banks in response to changes in market structure, interest rate uncertainty, and macro variables. However, the estimated impact of concentration and macroeconomic variables such as business cycle and monetary policy differs markedly depending on whether balance sheet data or disaggregated interest rate data is used to construct the spreads.

Randall (1998) examines interest rate spreads in the Eastern Caribbean and tries to explain why they are persistently high by comparison with other low-inflation countries. Randall includes the share of commercial bank public sector loans in her list of determinants of spreads and concludes that operating costs appear to be a key determinant of observed interest rate spreads, giving rise to the policy recommendation that efforts to expand the market size of efficient banks might help pave the way for greater efficiency. Tennant (2006) also showed that macro policy variables,

such as public sector domestic borrowing, discount rates and Treasury Bill rates, are commonly perceived to impact on commercial bank spreads (Tennant and Folawewo, 2009:7).

III. Data and Research Methodology

1. Model Specification

In this study, we examine the market determinants of banking sector interest rate spreads in the Albanian banking system. We have used, as Tennant and Folawewo, (2009) have used, the determinants of total assets of commercial bank, market size, inflation rate, exchange rate volatility, public sector borrowing and Treasury bill rate to guide the choice of independent variables, but instead of seeking the customary spreads or margins of individual banks, we have examined the spreads for the banking sector as a whole. The model is formulated for a better understanding of the broad state of efficiency of financial intermediation in the country and allows us to use of actual interest rate data in the calculation of spreads. A common proxy for market size is population. In our model, there are used 6 explanatory variables that are thought to impact on the banking sector interest rate spreads, considering the theoretical model or empirical studies of the same nature.

2. Dependent Variable

The dependent variable in this study is banking sector interest rate spreads and based on the data available from the Albanian Central Bank we have calculated the interest rate spreads. So, we have used the rates quoted on loans and deposits and inferring the difference between them. Thus, the dependent variable, bank interest rate spreads, is defined as the difference between bank lending and deposit rates (Tennant and Folawewo, 2009:8). According to Sologoub (2006), bank interest rate spreads is preferably measured as the difference between the average interest rate earned on loans and the average interest rate paid on deposits for individual commercial banks. However, as in the most of the developing countries, such bank-level data on interest rates are not available in Albanian banking system. Thus banking sector spreads are instead examined and are calculated by using the average commercial bank lending and deposit rate. This allows us to better understand the broad state of efficiency of financial intermediation.

3. Explanatory variables

In the regression analysis of this study, we have used six explanatory variables as the market determinants of interest rate spreads to account for the impacts of the structure and development of the banking sectors in the Albania. The relationship between the interest rate spreads variable and the ratio of the total assets of commercial banks to GDP, that is used as a proxy - the Bank/GDP ratio, informs us to how capture the structure and development of the banking sector (Tennant and Folawewo, 2009:8). As in the study of Demirguc-Kunt and Huizinga (1998:15), the bank/GDP ratio (BNKDEV) is calculated as the total assets of commercial banks divided by current GDP. We aim to capture the overall level of development of the banking sector in Albania by using this ratio. This ratio is expected to have a negative correlation with the dependent variable, as an improvement in the level of banking sector development. Reserve requirement ratio has been kept same for years (10% of deposits) so its relation with the spread is easily explained by the correlation of total assets/GDP with bank interest rate spreads.

We have also attempted to measures the impact of market size on banking sector Interest Rate Spreads, as some studies for small developing countries suggest that diseconomies of scale may increase per unit costs in commercial banks, thus keeping spreads high. As in the study of Tennant and Folawewo, (2009), in the absence of data on the actual sizes of banking markets in Albania, we have used the population (SCALE) size as a broad proxy for market size, even if it does not reflect the market size of individual banks. Consequently, unfavorable result of this approach could be that large bank may be able to achieve economies of scale by capturing relatively large share of the market. The relationship between proxy for market size variable and banking interest rate spreads is more likely to be negative, as banking sectors are expected to benefit from economies of scale in countries with larger populations, thus enabling them to keep their costs and spreads down (Tennant and Folawewo, 2009:9).

Inflation rate and exchange rate vitality as macroeconomic determinants of interest rate spreads included in our regression analysis to account for the impacts of macroeconomic instability and the macro-policy environment on banking sector interest rate spreads. Macroeconomic instability and the macro-policy environment may also affect the pricing behavior of commercial banks. In order to capture the effects of the macroeconomic and policy environment, our regression equations include inflation as an indicator of the cost of doing business in an economy, which has

been calcula ted as the annual percentage in the consumer price index. In similar literature on interest rate spreads, there is evidence that inflation is positively associated with intermediation spreads, particularly in developing countries where inflation is high and variable (Chirwa and Mlachila, 2002:7).

In our regression analysis, we have used exchange rate volatility as a proxy for macroeconomic instability or exchange rate risk. Exchange rate volatility reflects the changes in interest and inflation rates in countries with freely-floating exchange rates. Because increased macroeconomic instability raises the risk faced by commercial banks, exchange rate volatility (XRATVOL) is expected to be positively correlated with interest rate spreads, as the banking sector increases its spreads to protect against the increased risk (Folawewo and Tennant, 2008:11-12). Exchange rate volatility is calculated as the standard deviation of daily exchange rates for the previous 3 years. To check the macroeconomic instability in Albania, we are referred to a study done by European Bank for Reconstruction and Development (EBRD) '' Inflation, exchange rates and the role of monetary policy in Albania''.

Public sector borrowing as a percentage of total loans (CROWD) and Treasury Bill rate (TBILL) are used to analyzed the macro-policy environment. Public sector borrowing is a proxy for the extent of government dependence on the domestic banking sector for the financing of its fiscal deficit. This proxy measures for the entire banking sector, as in the study of (Tennant and Folawewo, 2009:11). Robinson (2002:18) asserted that the level of government borrowing and its influence on money and credit markets is an element of macroeconomic policy that imposes constraints on the flexibility on interest rates. Public sector borrowing from domestic banking sector to finance its deficit strengthens competition for financial funds and causes interest rates to rise. Thus, the relationship between CROWD and banking interest rate spreads is expected to be positive.

The last explanatory variable, the Treasury Bill rate (TBILL) is included. The central bank introduces indirect instruments to deal with excess liquidity, namely central bank bills and later, treasury bills for open market operations. However, due to lack of confidence, the central bank could use relatively high liquidity reserve requirements as an important lever of monetary policy and treasury bills to mop up excess liquidity in the economy. (Chirwa and Mlachila, 2002:8-9). Therefore, Treasury Bill is generally regarded as an indicator of the interest rate policy being

pursued by the government, and a benchmark for the rates charged by commercial banks. Thus, this variable is also expected to be positively correlated with IRS, because lower Treasury Bill rates would lead to lower interest rate spreads and vice versa (Folawewo and Tennant, 2008:12).

This approach, with some modifications, is taken in the study by Tennant and Folawewo,(2009). The model to examine the relationship between the banking sector interest rate spreads and its market and macroeconomic determinants is therefore specified as follows:

$$IRS_t = \sigma_0 + \sigma_1 BNKDEV_t + \sigma_2 SCALE_t + \sigma_3 INF_t + \sigma_4 XRATVOL_t + \sigma_5 CROWD_t + \sigma_6 TBILL_t + e_t$$ *(Where t represents the time periods)*

IRS_t = banking sector interest rate spreads at time t.

$BNKDEV_t$ = total assets of commercial banks/current GDP at time t.

$SCALE_t$ = population (broad proxy for market size) at time t.

INF_t = inflation at time t.

$XRATVOL_t$ = exchange rate volatility at time t.

$CROWD_t$ = public sector borrowing as a percentage of total loans at time t.

$TBILL_t$ = treasury bill rate at time t.

4. Data and Descriptive Statistics

The model above was analyzed using quarterly data from the regular publishing of Bank of Albania and Albanian Institute of Statistics (Instat) for period 2001-2007. The data collected (almost 8 years from 1 January 2001 to 31 December 2007) are grouped quarterly and each quarter is represented by one value. The used data are summarized in annex1.

Considering the variables used in our model as market determinants of bank interest rate spreads, we see that:

All the statistical results are summarized in Annex 2. The correlation between BNKDEV, which was the total assets of commercial banks, divided by current GDP and IRS results (0.02). As we see it is a very low value giving no significance for our model. This shows for a lack of competition in banking sector in Albania. Moreover, I want to support this conclusion with

another result. The Albanian banking system is relatively concentrated, with the four largest banks accounting for almost 70 percent of the aggregated assets. The high level of concentration shows once more the lack of competition.

The correlation between SCALE, which was represented by the population and IRS results (0.01). Again, this result means that the correlation between these two variables is insignificant.

Considering the variables used in our model as macroeconomic determinants of bank interest rate spreads, we see that:

Albania is a country with high economic stability during the transition period if we refer to the results of the study done by EBRD (Muço;, Sanfey and Taci, 2004). It is concluded that the weak link between money supply and inflation up to mid-2000 and exchange rate stability has played a key role in keeping inflation low in Albania. An indirect effect of interest rates on inflation may have occurred through high deposit rates and the reduced demand for domestic currency deposits. Data published by bank of Albania show that there is a clear and strong link between exchange rate stability and inflation. (Muço;, Sanfey and Taci, 2004:3-4). Albania has been setting and achieving a range of inflation of 2-4% which is relatively low. However, here it is important to emphasize the fact that the data are not much reliable and available enough to get the accurate results.

In the estimation of the interest rate spreads, the other variable (CROWD) which measures the public sector borrowing as a percentage of total loans results 0.1. Again this value is not significant.

The correlation between TBILL and IRS results 0.24. This result shows that though positively correlated still is not at the expected values.

The regression to see how the dependent variable (Y_t) changes as the independent variable (X_t) changes is analyzed below:

a. General study of the model

This means testing the overall significance of a model. For this reasons are build up two hypotheses:

The "null" hypothesis, which is denoted H_0 (H-naught), specifies a value for a parameter, and

The alternative hypothesis, which is denoted Ha.

H_0: $a_1 = a_2 = a_3 = a_4 = a_5 = a_6 = 0$ (the model is not significant)

Ha: at least one of the a_t is not zero (the model is significant)

If this null hypothesis is true, none of the explanatory variables influence *y*, and thus the model is of little or no value. If the alternative hypothesis Ha is true, then at least one of the parameters is not zero.

The alternative hypothesis does not indicate, however, which variables those might be. To test the null hypothesis we will use a test based on the *F*-distribution (Fisher). Thus to *test the overall significance of a model* the *F*-test statistic can be modified as

$$F^* = \frac{(SST - SSE)/k - 1}{SSE/(t-k)}$$

The calculated value of this test statistic is compared to a critical value from the $F_{(k\text{-}1,t\text{-}k),}\alpha$ distribution = F_{cr}. If $F_{cr} > F^*$ than the H0 is true and the model is not significant. If the $F_{cr} < F^*$, than the Ha is true and the model is significant.

b. Partial study of the model.

For each of the independent variables, is tested the significance of them, if they influence Y or not. Even in this case are build up the two hypotheses:

H0: $a_t = 0$ (is not significant)

Ha: a_t is not zero (is significant)

Thus to test significance of the each variable is used the t-distribution (t-studenty):

$$t^* = \frac{(a_t - \hat{a})}{\hat{\sigma}_a}$$

The calculated value of this test statistic is compared to a critical value from the $t_{k\text{-}1,}\alpha$ distribution = t_{cr}. If $t_{cr} > t^*$ than the H0 is true and the variable is not significant. If the $t_{cr} < t^*$, than the Ha is true and the variable is significant.

If the model is significant, means that the independents variables effect on the dependent variable and vice versa.

To find out which of the hypothesis is valid, is made the regression. In fact, the data cannot be considered very reliable and they are lack in number. However, I have presented my opinion based on these data. From the testing results that the model is insignificant and each of the variables are insignificant (annex 2.).

So, this shows once more that the spread of interest rates should be affected by other factors.

IV. Other Factors

A study Published by World Bank, 2007 ‘’Albania Access to Finance for Enterprise Sector’’ has analyzed in detail the loan demand and supply in Albania. At the end they have concluded that the loan demand has been relatively higher compared to the supply of banks during these years. This conclusion helps the hypothesis that the banks have had the power to keep the loan rates high (as a result the spread) because of the high demand.

Another issue that helps this hypothesis is the institutional problems that banks face while operating here which make them keep the price higher to cover the risks. Below is made the analyses related to that.

Banks in Albania continue to give high collateralized loans. However, banks evaluate that the biggest barrier in expanding lending is the collateral problems.

The main issue is that many of the properties do not have the proper legal title. This has to do with many changes in the property laws which are accompanied with problems during implementation. The other reason is that there are many properties which are constructed without permit so no legal registration exists for them.

The other issue is the high costs of registrations, which are both legal (taxes, notary expenses etc.) as required by law and informal payments. Moreover, the access to the Real Estate Registration Office is extremely difficult and very bureaucratic. So, people have to wait too long to get the title deed or to do any verification of the property.

Still the reliability in the title deeds is limited which makes the work for banks difficult and time consuming, which sometimes results in boring the customers.

Another issue has to do with the foreclosure procedures which are very long and very costly. Where contract enforcement is efficient, businesses are more likely to engage with new

borrowers or customers. Three indicators of the efficiency of commercial contract enforcement are developed and the results of a study done by World Bank are below:

1. Historical data: Enforcing Contracts in Albania

Enforcing Contracts data	Doing Business 2006	Doing Business 2007	Doing Business 2008
Rank		76	74
Procedures (number)	39	39	39
Duration (days)	390	390	390
Cost (% of claim)	31.8	31.8	31.8

Source: World Bank (2007:45): Doing business 2008 Albania

This happens mainly because the bailiffs have the monopoly for the foreclosure. Another problem is that not in all cases the banks are sure about the foreclosure. The lawyers confirm that the regulatory framework as well has its problems which make the foreclosure difficult and in some cases impossible.

Albania faces high informality. Based on the INSTAT publishing it is calculated to be around 30%. This affects the financial system in many ways. The first one, is that being able to work in an informal economy, many shops do not want to put the card machines because they do not want their transactions to be registered and then reported. Thus although banks have invested in card technologies, still this issue restricts the card usage. The second and the most important one have to do with credit procedures. Being in a highly informal economy, where most of the businesses do not document many of their transactions and where the balance sheets and income statements may be altered to avoid taxes as much as they are far away from the real activity of that business makes the work for the banks very hard. Verification of the business activity is very difficult which in turn causes the long and difficult lending procedures.

Concluding, the collateral problems on one side and informality on the other are the main factors which restrict many of the potential customers from getting loan from banks. This results in continuous high demand for loans and remaining risks for the banks which are keeping the rates higher to cover these risks.

V. Concluding remarks

From the analysis done on market determinants of interest rate spreads of the Albanian banking sector resulted that almost none of the independent variables considered as determining factors like Assets/GDP ratio, population, T-BILL rate and government financing through bank loans had considerable correlation with the spread. Moreover, macro stability resulting from the analysis could have resulted in decreasing the interest rate spreads which did not happen.

The collateral problems on one side and informality on the other are the main factors which restrict many of the potential customers from getting loan from banks. This results in continuous high demand for loans which is not fulfilled by the actual supply of the banks. Moreover, these problems make the banks evaluate the situation as risky thus keeping higher rates to cover these risks. At the end the loan demand being relatively higher compared to the supply of banks during these years and the resulting higher interest margins speaks tells us that banking intermediation in Albania have not resulted so efficient so far.

Concluding, the ongoing financial crisis is expected to affect the interest rate margin. The situation has made the banks thinking the situation as more risky. So, based on that interest rate on loans are expected to rise considerably. On the other side, in order to create some more liquidity to market, I expect the rate of T-bill to fall thus the deposit rate to fall. This is expected to result in even higher interest margin for the banks.

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www.bankofalbania.org;

www.instat.gov.al;

Annex 1

	12-months interest rate spread (in %)	T-bill 12-month (in %)	Bank Assets in million ALL	Bank Assets/GDP (ratio in %)*	Pop.*	Claims on Public Sector/Total Loans (%)	Inflation
Mar-01	**8.33**	**11.20**	**286,534**	**49.12**	**3,063,318**	**2.62**	**2.90**
Jun-01	**6.30**	**10.15**	**289,302**	**48.77**	**3,068,526**	**2.79**	**4.00**
Sep-01	**5.84**	**10.49**	**301,210**	**49.95**	**3,073,734**	**2.64**	**3.50**
Dec-01	**4.30**	**10.49**	**318,457**	**51.96**	**3,078,941**	**1.96**	**3.50**
Mar-02	**5.95**	**10.50**	**318,071**	**51.08**	**3,084,149**	**1.88**	**7.50**
Jun-02	**5.66**	**12.00**	**314,358**	**49.08**	**3,088,806**	**0.28**	**3.70**
Sep-02	**4.95**	**12.30**	**327,727**	**49.78**	**3,093,463**	**0.18**	**5.30**
Dec-02	**8.00**	**12.99**	**339,333**	**50.18**	**3,098,120**	**0.09**	**1.70**
Mar-03	**7.16**	**12.14**	**351,158**	**50.59**	**3,102,777**	**0.01**	**1.30**
Jun-03	**6.35**	**10.49**	**358,177**	**50.57**	**3,106,969**	**-**	**2.60**
Sep-03	**3.28**	**10.30**	**373,922**	**51.75**	**3,111,160**	**-**	**2.80**
Dec-03	**2.90**	**9.59**	**373,635**	**50.71**	**3,115,352**	**-**	**3.30**
Mar 2004	**3.81**	**9.35**	**390,988**	**52.06**	**3,116,399**	**0.04**	**4.00**
Jun-04	**10.81**	**9.10**	**391,568**	**51.01**	**3,117,447**	**-**	**2.90**
Sep-04	**8.76**	**8.49**	**414,367**	**52.84**	**3,118,495**	**0.05**	**2.00**
Dec-04	**7.74**	**8.19**	**426,440**	**53.25**	**3,119,543**	**0.17**	**2.20**
Mar-05	**6.99**	**7.20**	**454,919**	**55.66**	**3,123,403**	**0.13**	**1.60**
Jun-05	**10.55**	**6.81**	**476,876**	**57.02**	**3,127,263**	**0.13**	**2.90**
Sep-05	**7.63**	**9.15**	**492,824**	**57.63**	**3,131,122**	**0.07**	**3.10**
Dec-05	**6.59**	**7.30**	**496,561**	**56.81**	**3,134,982**	**0.06**	**2.00**
Mar-06	**8.58**	**6.50**	**521,429**	**58.39**	**3,138,958**	**0.09**	**1.50**
Jun-06	**6.75**	**5.80**	**543,512**	**59.38**	**3,142,934**	**0.15**	**2.50**
Sep-06	**7.81**	**7.19**	**567,744**	**60.55**	**3,146,910**	**0.03**	**2.60**
Dec-06	**5.70**	**7.90**	**624,279**	**65.04**	**3,150,886**	**0.09**	**2.37**
Mar-07	**6.18**	**7.49**	**648,340**	**66.01**	**3,163,165**	**0.31**	**2.73**
Jun-07	**4.86**	**8.00**	**667,050**	**67.91**	**3,175,443**	**0.99**	**2.52**
Sep-07	**4.45**	**8.10**	**700,078**	**71.28**	**3,187,722**	**0.60**	**2.69**
Dec-07	**7.22**	**8.48**	**742,855**	**75.63**	**3,200,000**	**1.36**	**3.50**

***As population and GDP are declared yearly I have distributed their increase in the following year proportionally through the quarters.**

Source: **Bank Assets, GDP, Claims on Public Sector &Total Loans: Bank of Albania – time series;**

Population: INSTAT – Population on 1 January.

Inflation: Bank of Albania –Annual Report November 06 (pg.18), Statistical Report September-07 (TABLE 01-06), Statistical Report December 07 (TABLE 01-06):

12-months interest rate spread & t- bill 12-month: Monthly_Report_January_02, Monthly Report_January_03, Monthly Report January 04, Monthly ReportJanuary,05, Monthly Report January 06, Monthly Report January 07, Monthly Report December_07

Annex 2

The model is NOT significant; none of the variables are significant.

Y = IRS 12 months **X1= stdev(LN)** **X2 = T-bills 12 months** **X3 = Assets/GDP**
X4 = Inflation **X6 = Population**
X5 = Public loans/ Tot loans

a0 =	-0.649	t1* =	-0.38844
a1 =	-9	t2* =	1.228042
a2 =	0.4557	t3* =	-0.30584
a3 =	-0.001	t4* =	1.365744
a4 =	0.005	t5* =	0.25642
a5 =	0.0027	t6* =	0.28601
a6 =	2E-07	F* =	0.772115
		t kr =	2.042
		Fkr =	2.57

Regression Statistics	
Multiple R	0.4251
R Square	**0.1807**
Adjusted R Square	**-0.053**
Standard Error	0.02
Observations	28

H0 : a1 = a2=..=a6
Ha : at least one <>0

Fkr > F* => H0 stands

Correlation

	Y	*X1*	*X2*	*X3*	*X4*	*X5*
Y	1					
X1	0.0448	1				
X2	0.238051	0.739	1			
X3	0.024971	-0.944	-0.6	1		
X4	0.316024	0.349	0.33	-0.2	1	
X5	0.103561	0.358	0.27	-0.1	0.44	1
X6	-0.01414	-0.971	-0.7	0.93	-0.33	-0.42

H0 : a1 = 0
Ha : a1<>0
t1*< tkr => H0 stands

H0 : a2 = 0
Ha : a2<>0
t2*< tkr => H0 stands

H0 : a3 = 0
Ha : a3<>0
t3*< tkr => H0 stands

H0 : a4 = 0
Ha : a4<>0
t4*< tkr => H0 stands

H0 : a5 = 0
Ha : a5<>0
t5*< tkr => H0 stands

H0 : a6 = 0
Ha : a6<>0
t6*< tkr => H0 stands