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DETERMINANTS OF BANK'S NET INTEREST MARGINS IN KOSOVO

The aim of this paper is to investigate internal and external determinants that impact the Net Interest Margin (NIM). The paper employs an OLS-PSCE procedure using quarterly Panel Data (From March 2013 to December 2019) for commercial banks in Kosovo. Results suggest that the Net Interest Margin in the banking sector in Kosovo is mostly influenced by factors within the bank such as: Loan-to-Deposit Ratio; Operation Costs and Fee Income, but less affected by external factors besides inflation. In addition, results suggest that external factors do not influence the net interest margin; therefore, a governmental policy intervention might not have an impact on Net Interest Margin. The results of the research are important for commercial banks in Kosovo, since they can help improve the efficiency through the internal and external indicators that are impacting the NIM.

Keywords: *Net Interest Margins, Loan-to-deposit ratio, Operating costs, Fee Income, Liquidity, Credit risk, Inflation.*

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1. INTRODUCTION

Financial intermediation is essential for economic development and financial stability of a country. This intermediation in Kosovo is mainly carried out by commercial banks, which can still be considered as a traditional intermediation between depositors and borrowers. In the recent years, in some Central and Eastern European countries, debates took place between politicians, the academic community of the financial industry and the general public about the economic profit from the banking sector. There has been extensive research about the role of banks and their ability for economic growth and recovery, especially in countries where lending activity is immobile or too low (Dumicic & Rizdak, 2013).

Currently, most of the banks income depends on the interest revenue that they receive which is based on interest rates. This also determines the interest banks pay to depositors and the interest income they receive from loans. However, these incomes have decreased as a result of lower interest rates on both sides of the balance sheet. Banks have transformed the channel of revenues, where in this decade the revenues from interest income have decreased while the revenues from fees and commissions have increased. This process is not only unique for Kosovo but is being adopted throughout the entire banking industry. Banks charge and pay different types of interest rates and have a variety of different categories of assets and liabilities. There is no unique way to measure the difference between the banks charge on loans and the price of their sources of funding. One of the best and most widely used indicators of the cost and efficiency of financial intermediation is the bank's net interest margin. Regardless of its common use, it should be noted that this indicator has some potential weaknesses, as it does not take into account other sources of income and costs for the bank and is not a solid representative of a bank's marginal costs and revenues (Brock & Suarez, 2000).

In the banks' perspective, the net interest margin is an important determinant of profitability, which represents the difference between interest income and interest expenses in relation to the average of interest-bearing assets. From economic perspective interest rate combined with macroeconomic variables, client risk, and competition are one of the main factors affecting the overall interest rate level on bank lending.

Studies have found that the direct effects of changes in the net interest margin (NIM) and the return on assets ratio (ROA) vary from bank to bank. Analysis for U.S. banks have found that in general, rate changes have greater short-run impact on small banks as they depend more on traditional intermediation of private client deposit. These banks are more conservative in deciding the price on deposits and loans, where many of them have no interest rate variable (Genay & Podjasek,

2014). Large banks in US usually have a greater ability to manage interest rate risk and reprice their liabilities, and by this they are less affected by changing in interest rate and creating their own advantages in cost of funding and in net interest margin. In small banks the opposite is true since the largest effect is mainly due to regulatory changes (Covas, et al., 2015).

In many countries the effect of different factors on the net interest margin of banks varies considerably. This paper is novel since it aims to identify the main factors that determine the net interest margin in the banking industry in Kosovo which is in transition economy, not a member of EU with EUR as local currency and does not have a long tradition on the financial sector. Additionally, this paper includes the internal factors that depend on the bank's management, as well macroeconomic factors that might impact the Net Interest Margin.

The methodology used in this paper to study the Net Interest Margin in the banking sector in Kosovo is done through the OLS procedure – PCSE (OLS with Panel Corrected Standard Errors). The methodology is not new; rather the methodology applied for these data is novel.

The paper is structure as follows: First, in the literature review there are studies presented from different authors that study the impact of various factors on the net interest margin, Secondly, general development of the banking sector in Kosovo where the performance of banks is presented. Third, the data structure together with descriptive statistics is shown and explained. Further, in this chapter the methodology together with the empirical results are shown. Lastly, the conclusion with policy advice is given.

2. LITERATURE REVIEW

The initial concept of the net interest margin was understood as the difference between interest income and interest cost in terms of total assets. Later, the concept of calculating the Net interest Margin rate evolved where it is calculated as the division of the difference of interest income and interest expenses by the average earning assets. Even though, it is a new concept it has its disadvantages due to the fact that it does not take into account bank charges and income revenue from fees and commissions and is estimated to deviate significantly from the marginal difference. (Brock & Suarez, 2000).

A large body of literature states that the Net Interest Margin depends or is a function of both internal and external determinants. In earlier research, the authors Demirgüç and Huizinga (2018), using bank level data for 80 countries in the

1988-1995 period, found that differences in interest margins and bank profitability reflect a variety of determinants: bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and several underlying legal and institutional indicators.

A majority of studies of internal and external factors on Net Interest Margin have been conducted in developed countries such as US and Europe, while for developing countries and Western Balkans the studies are scarce. The internal factors¹ depend on bank accounts (Balance Sheets and Income Statements) while the external factors that have an impact on net interest margin are of macroeconomic nature (Inflation, Debt to GDP, Euribor Rates etc.).

Authors, Hanzlik and Teply (2020) analysed the relationship between the net interest margin (NIM) of US and European banks and market interest rates in a low interest rate environment. They used a large sample of annual data on 1,155 banks from United States and EU member countries during the 2011-2016 periods, which also cover periods of zero and negative rates in many of the observed countries. They come to three main conclusions: First, NIM is significantly influenced by the different institutional designs of bank-based or capital-based financial markets. Second, there are differences in NIM caused by bank size, although these are not fully captured by their methodology. Finally, they show significant differences by bank type: saving banks, real estate and mortgage banks, and cooperative banks report consistently lower NIMs than commercial banks and bank holdings. Nevertheless, the external factors as shown by Dumičić and Rizdak (2013) also play a role on Net Interest Margin. They studied 11 CEE countries from 1999 to 2010 where they find that in the crises period significant rise in government debt accompanied by the increase in macroeconomic risks and abating capital inflows were pushing margins up while other factors such as low credit demand, higher capitalization and significantly increased share of non-performing loans pressured banks' margins down.

In addition to external factors, also regulatory requirements rules play a major role in Net Interest Margin. Garcia and Guevara (2020) using panel data between 2000 and 2014 for OCED countries analysed the impact of capital regulation and deposit insurance. They found that that the relationship between net interest margin and capital requirement as well as deposit insurance premium is positive. In addition to regulatory and institutional settings, Angori et al., (2019) found that regulatory environment is an important driver of the net interest margin from a broad sample of banks in Euro Area for the period 2008-2014.

The Net Interest Margin has been studied also in the developing countries but is scarce on the Western Balkan Countries. For developing countries, Fungacova

¹ Known in literature as micro determinants

and Poghosyan (2011) showed that the ownership structure has a high correlation on the performance of the bank. Porta (2003) points out that locally owned banks allocate a higher share of their loan portfolios to higher risk industries while Martinez and Mody (2014) show that foreign-owned banks outperform locally owned banks.

In Western Balkan Countries, the Net Interest Margin is also studied in similar fashion. Kalluci, (2010) analysed Net Interest Margin as a measure of efficiency for the banks which operate in Albanian banking system with the main focus in the identification of the factors that affect this indicator. The author, find that the Net Interest Margin is positively impacted by the interest rate volatility (mainly of euribor, domestic currency's and slightly of the libor rate), by the level of operating expenses which have had an increasing tendency and by the amount of banks' reserves in the Central Bank. Other factors that affect the net interest margin are the level of bank capitalization; net commission incomes which are negatively related to the dependent variable implying that these two indicators are substitutes of each-other; the effectiveness of management work; credit risk and the concentration level in terms of loans. In a research for North Macedonian banks, authors Iloska & Global, (2014), examined the determinants of the net-interest margin (NIM), using regression analysis and employed bank level data for the period between 2008 and 2011. Their results showed that high net-interest margin and hence profitability tend to be positively associated with banks that employ quality and high-paid staff, and banks that concentrate a great part of their investments in loans. During the period under study, their results showed that management's behaviour towards risk, the size of the bank and expenses management did not have a clear-cut or significant impact on bank profits.

Since the literature did not reach a consensus and the results vary from country to country Thomas and Saunders (1981) state that overall, the most important factors on Net Interest Margin are estimated to be: Liquidity, Credit Risk, Loan to Deposit Ratio; Capital Adequacy Ratio, Operational Cost, Bank Size, Inflation, Interbank Rates.

Credit risk belongs to the group of factors with the highest impact on banks' interest margins. The authors Schwaiger and Liebeg (2008) consider that credit risk is the factor with the greatest impact on net interest margin. Banks set higher interest margins so that they can cover the anticipated and unanticipated credit risk (Kasman, et al., 2010).

The impact of non-performing loans (Credit Risk) on the net interest margins is measured by the coverage of non-performing loans with reserves. The increase in the ratio of non-performing loans and increasing reserves for bad loan ratio affects the bank's profitability, particularly during the crises period. (Fonseca & González, 2008).

The ratio of client loans to deposits represents a breakdown in liquidity risk, which became particularly important during the financial crises, when the inter-bank market was almost frozen and characterized by liquidity accumulation, declining volumes and an increase in interbank interest rates in the European Union countries (Heider, et al., 2009). In addition, banks in Central and Eastern European countries may have also been affected by the reduction, as the shareholders were pressured to meet high capital requirements. The impact of this ratio on the net interest margin is ambiguous, depending on whether deposits are cheaper than interbank financing.

The capital adequacy ratio is used as an indicator of the ability of borrowers to repay loans granted from banks. Capital adequacy limitations aim to prevent banks from accepting high levels of risk and to ensure the stability of the banking sector. The relationship between net interest rate and capital adequacy ratio can be positive or negative, depending on the magnitude of the transfer of these factors to clients (Claeys & Vennet, 2008). Higher capital adequacy ratio implies that banks hold more capital in compared to total assets. If competition on the market does not allow the bank to transfer the cost of excessive capital to the clients, the more capitalized banks would have lower interest margins. On the other hand, it can be expected that less capitalized banks are more tempted to accept more risk looking for higher returns (Schwaiger & Liebeg, 2008). This is also true in the case of Kosovo where the Micro Finance Institutions have very high interest rate as compared to the banks.

The bank and the structure size in banking market have been assessed to be factors that affect the net interest margins. The impact of the banking market structure on the interest margin is usually approximated by the Herfindahl Hirschman Index (hhi) or the Lerner index. The literature suggests two opposing hypotheses regarding the effect of concentration on pricing behaviour of banks. The first is the so-called structure-driven performance (SDP) hypothesis, which argues that a more concentrated banking sector will behave oligopolistic ally and a higher concentration will cause higher interest margins for banks. The second hypothesis the one of efficient structure (SE) confirms that concentration produces efficiency benefits (due to cost reduction); leading to lower interest margins (Papa-vangjeli & Leka, 2016).

Operational cost (OpCost), the operating cost – to income ratio measures the efficiency of banks. This variable indicates how costly it is for a bank to produce an operating income unit in terms of expenses that are not related to interest expenses. Banks with high operating costs are expected to require a higher interest margins between loans and deposit interest rate to cover these costs to a large degree (Joaquin M & Guevara M., 2004). Higher operating efficiency allows banks to lower interest margins through lower loan rates or higher rates on deposit (Claeys & Vennet, 2008).

Non-interest income, the literature states that there is an uncertainty effect of non-interest income on the bank net interest margin. In a highly competitive market where banks have no price setting power banks tend to decrease interest margins if they can compensate the lower interest income received by charging higher fees. In this case, fee income and other non-interest income are expected to be a substitute of interest income and the relation between them is expected to be negative. On the contrary, if banks operate in a highly concentrated market and they have some market power to set the interest rates, non-interest and interest income will be complementary sources of each other. The correlation between the variables in this case will be positive (Estrada, et al., 2006).

Inflation implies more costs. The positive relationship between inflation and the bank profitability implies that the bank income increases more with inflation than bank costs. Moreover, real high interest rates are associated with higher interest margins and profitability, especially in developing countries. This may reflect that in developing countries interest deposits frequently pay zero or below the market interest rates (Demirgüç-Kunt & Huizinga, 2018). Inflation rates may, additionally, affect lending and loan pricing if borrowers' real incomes are sticky. If incomes do not grow in line with inflation, a rise in inflation increases costs (for both households and firms) and lowers the amount of available funds for debt repayment (Angori, Aristei and Gallo, 2019).

The interbank rate is considering one of the factors that impacts the interest rate on deposits and loans in the market. In particular, interest rates in developed markets are directly correlated with interbank rates such as EURIBOR or LIBOR, with immediate effects. The impact of interbank rates on determination of interest rates on loans and deposits have not been noticed in Kosovo, therefore, the effects of interbank rate on the net interest margin are unclear.

Impact of domestic debt on net interest margin is seen as positive and statistically significant mainly in those countries where the level of debts is high. This indicates that an increase in government debt will lead to an increase of the net interest margin, due to increased macroeconomic risks and potential volatility. There are only a few research papers that include this fiscal variable in the analysis of net interest margin, but majority of them suggests a positive correlation between two variables (Papavangjeli & Leka, 2016).

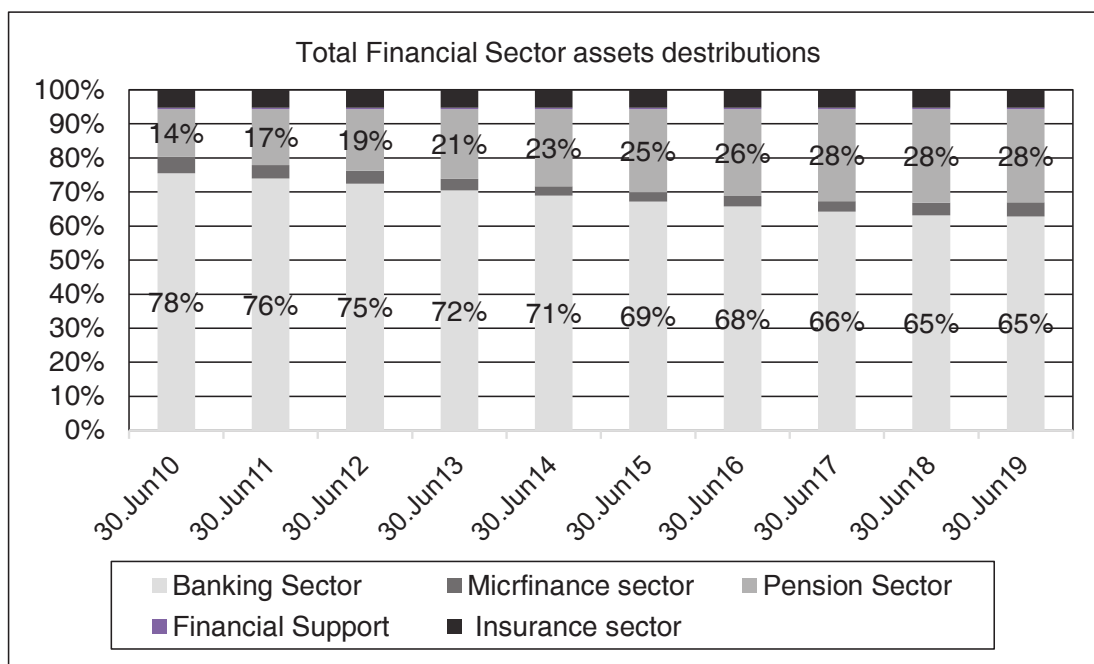
3. INSTITUTIONAL BACKGROUND

Kosovo's financial sector in terms of assets is dominated by the banking and pension sector. The financial system in Kosovo is characterized with high stabil-

ity), and upward trend with positive contribution from all constituent sectors. The value of financial system assets in June 2019 reached 6.67 billion euros, which corresponds to an annual increase of 11.2 % from the previous period (BQK, 2019).

Figure 1.

TOTAL FINANCIAL SECTOR ASSETS DISTRIBUTION

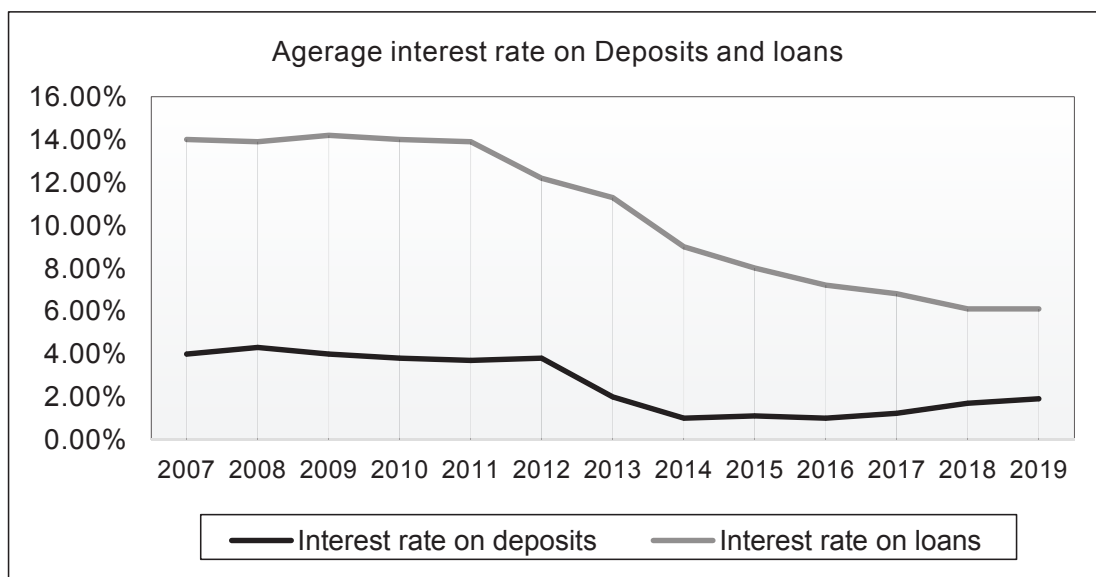


Source: CBK and Authors calculation

There are 10 licensed banks in Kosovo; eight of them are foreign owned banks, which continue to dominate the market where the share is 81%. The main source of income for the banks in Kosovo comes from loan lending, which is continuously growing in recent years, due to the loan portfolio growth despite the fact that loan interest rates on deposits has declined. The total outstanding loans in banks have reached 3 billion euro and the trend is continuing to be positive. Customer deposits continue to be the main contributor to banking financing activities Total deposits in the banking sector at the end of 2019 reached 3.8 billion euros with the positive trend. Interest rates on deposits and loans in banking sector in Kosovo are declining; the decline on interest rate in loans is higher than in deposits. This trend is expected to affect the net marginal rate.

Figure 2.

AVERAGE INTEREST RATES ON LOANS AND DEPOSITS

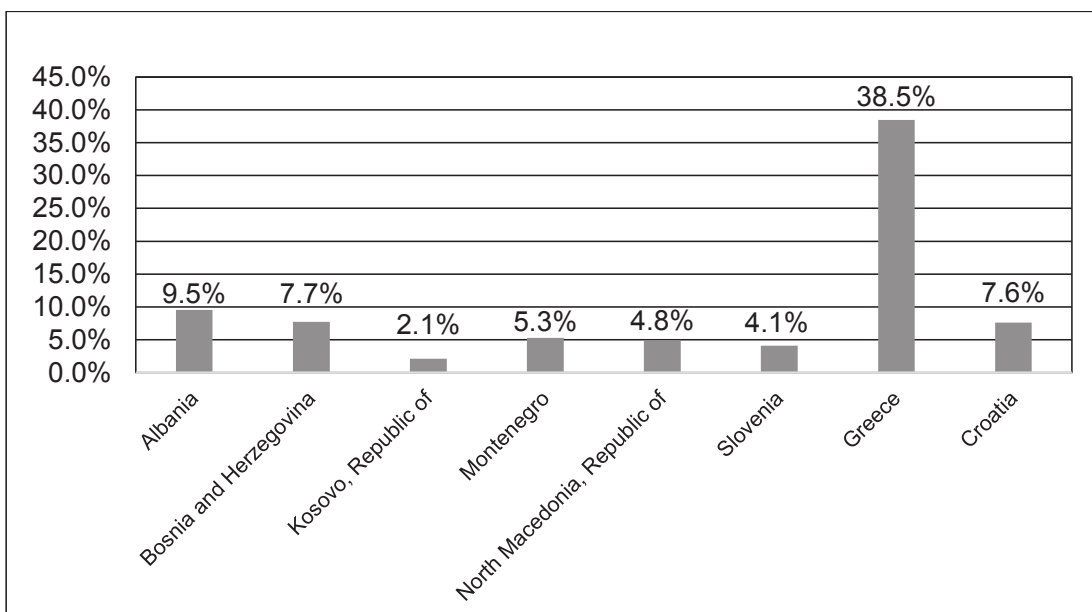


Source: CBL and Authors Calculation

Quality of Loan Portfolio in Kosovo remains high as compared to the region. The non-performing loans in the banking sector have been decreasing during 2019, reaching the lowest level since the end of 2010. Non-performing loan ratio (NPL), to total loans is 2.09 %. This indicator shows stability and high quality of the loan portfolio in the banking sector in Kosovo. In addition, this indicator is estimated to be one of the factors that have influenced the reduction in interest rate on loans.

Figure 3.

NON-PERFORMING LOANS TO TOTAL GROSS LOANS NPL
(IN PERCENTAGE), IN KOSOVO AND COUNTRIES IN THE REGION, 2019



Source: IMF and authors calculation

The data in the following table shows that the banking sector in Kosovo is characterized by a return on assets of 2.3% and a return on capital of 18.4%, which are significantly higher than in the region. See the following table for more details:

Table 1.

**BANKING SECTOR PERFORMANCE IN SELECTED COUNTRIES (%),
 2019**

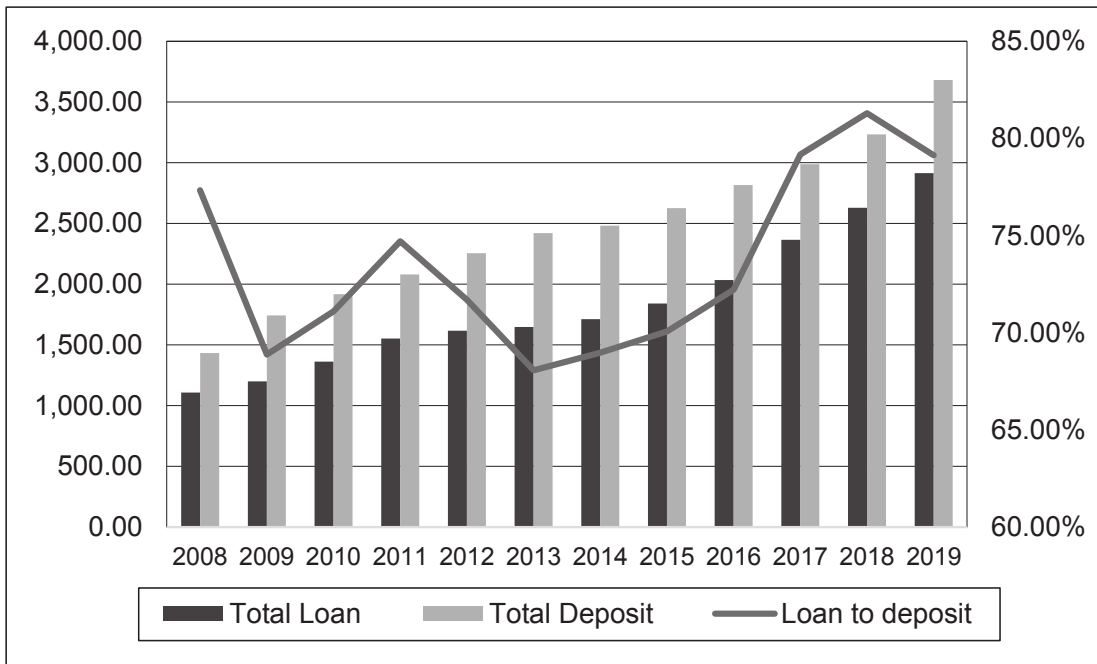
Performing factors (%)	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North Macedonia
<i>NPL/Total Gross Loans</i>	9.53	7.74	2.09	5.29	4.82
<i>Return on Assets</i>	1.47	1.46	2.3	1.56	1.50
<i>Return on Equity</i>	13.50	11.09	18.4	12.60	13.50
<i>Interest Margin to Gross Income</i>	75.46	56.98	79.21	57.28	59.67
<i>Liquid Assets to Total Assets (Liquid Asset Ratio)</i>	15.37	30.02	27.67	24.28	24.01
<i>Liquid Assets to Short Term Liabilities</i>	21.30	46.19	37.03	35.90	41.86

Source: IMF and authors calculation

The interest margin in relation to gross income in banks is 79.21%, which sheds light that the position of the banking sector in Kosovo as well as in Albania still operates with high interest rates in the markets in terms of lending, and almost 80% of profit is generated through interest income. As this rate is declining, banks are substituting interest income with income that comes from fees and commissions. Liquid assets ratio is almost the same throughout the region, and this high level of liquidity is characterizing the global financial system. This excess bank liquidity is leading to lower interest rates on loans.

Figure 4.

LOANS AND DEPOSITS IN THE BANKING SYSTEM IN KOSOVO
 2008-2019 (IN MIL)



Source: Banks financial statements, author's calculation

The number of foreign owned banks has increased since 2004 where it represented 61.6% of the market while in 2019 it represents 86.5%. Non-Performing loans show a bell-shaped behaviour where they were higher in the past decade but steadily decreasing since 2015.

Some other indicators of the banking sector in Kosovo are shown in the following table:

Table 2.

SUMMARY OF THE BANKING SECTOR INDICATORS IN KOSOVO

	2000	2004	2008	2012	2016	2018	2019
STRUCTURE							
<i>No. of banks (foreign owned)</i>	1(1)	7(2)	8(6)	9(7)	10(8)	10(8)	10(8)
<i>Participation of foreign banks in the banking sector (%)</i>	100	61.6	90	89.42	88.67	86.53	86.5
PERFORMANCE							
<i>Net Interest Income (million €)</i>	N/A	44.02	111.68	136.09	160.28	170.98	179.37
<i>Net profit (million €)</i>	N/A	11	34	18.6	75.5	88	86.2
<i>Non-performance loans (% of total loans)</i>	N/A	2.4	3.3	6.5	4.9	2.7	2
<i>Credit / deposit ratio</i>	3.6	53.8	81.9	83.2	77	79.44	75.9
<i>Capital / assets ratio at risk (%)</i>	N/A	16.7	16.8	14.3	17.8	17	15.9
<i>Average return on total assets (%)</i>	2.5	2.2	2.9	1	2.3	2.3	2.1
<i>Average return on equity (%)</i>	42.3	26.2	26.5	19.7	19.7	18.2	17.2
<i>Net interest margin (%)</i>			0.06	6	5.4	5.1	4.8
<i>Net interest margin on gross income (%)</i>				75.4	68.1	78.4	80.6
<i>Non-interest expenses on gross revenues (%)</i>				86.6	49.6	48.2	48.1
LEVEL AND COST OF MEDIATION							
<i>Total assets of the banking sector (% e GDP)</i>	3.4	26.2	47.2	48.9	55	59.1	64.9
<i>Deposits (% e GDP)</i>	3.1	22.3	37.7	42.8	47.7	50	55.4
<i>Loans (% e GDP)</i>	0.1	12	30.9	34.9	36.7	41	43.5
<i>Loan interest rate (%) *</i>	N/A	14.8	14.6	12.2	7.2	6	6.4
<i>Interest rate on deposits (%)</i>	N/A	2.8	4.6	3.8	1.2	1.4	1.6
<i>The difference between the interest rate on loans and deposits (%)</i>	N/A	12	9	9.6	6	4.6	4.8

*Interest rate for new Loans

**Interest rate on new deposits

Source: CBK and calculations by the authors

Lending in the banking sector in Kosovo is mainly financed by customer deposits, where the sector is characterized by over 80% of loan-to-deposit ratio, which rate enables this sector to be highly liquid and with a high interest margin on income of 80%. It shows that the main source of income for the sector is the interest margin of loans and deposits where the difference between the interest rate of loans and deposits is 4.4%. Moreover, the net interest margin of 4.8% continues to slightly decrease in recent years as a result of the high growth in the interest-bearing asset base and also the decrease of the margin between the interest received from lending and interest paid on deposits.

The banking sector continues to remain liquid, stable and well-capitalized, with a capital adequacy ratio of 15.9 % as of December 2019 while the minimum required rate is 12%. The decline in the capital adequacy ratio is a result of the increase in risk-weighted assets due to increased lending activity, despite the decline the banking sector has a high stability of regulatory capital.

4. DATA AND METHODOLOGY

4.1 Selected data and variables

As stated in the Introduction Chapter, the purpose of this study is to analyse and to see which factors have an impact on the Net Interest Margin. From literature review, we have selected most common variables that have an impact on the net interest margin. These variables are divided into internal ones such as: The capital adequacy ratio (CAR), Credit Risk (NPL), Bank Size (HHI), Loan to Deposits (L/D), Bank Liquidity (Liquidity), Operating Costs (OpCost), Commission Income (InFee) and external factors such as: Domestic Debt to GDP (DeBt), Inflation (INF) and European interbank rate EUR (EURIBOR).

In order to test the impact of these variables on the net interest margin of seven banks which dominate more than 98% of the market, quarterly panel data with 28 quarters (March 2013- December 2019) were used. The data for this period are gathered from balance sheets, income statements of banks and quarterly reports of financial indicators. Three banks were excluded from analysis, since there were no data published for these banks. Although the data of these banks is not included, their impact on the variable analysis would be insignificant given the fact that the market represented by these banks is less than 2 %. Additionally, these banks had a market penetration in last four years.

Table 3.

DESCRIPTION OF THE VARIABLES AND EXPECTATION OF
 THEIR IMPACT ON THE ANALYSIS

Variable name	Naming	Description	Unit	Expected effect
Net Interest Margin (<i>Dependent Variable</i>)	NIM	The difference between the interest rate that a bank pays to those who put money in the bank and what it gets from their investment in relation to the average of the assets that bring interest.	%	
<i>Independent internal variables</i>				
Capital Adequacy Ratio	CAR	Ratio of regulatory capital to risk-weighted assets.	%	+/-
Credit Risk	NPL	Non-performing loans relative to total assets.	%	+
Bank Size	HHI	Concentration of banks' assets in relation to total assets in the market.	%	+/-
Bank Liquidity	Liquidity	Liquid assets of the bank in relation to total assets.	%	-
Operating costs	OpCost	Operating costs-to-total earning assets	%	+
Revenues from commissions	FeeInc	Fee Income to-total earning assets	%	-
Loan- to- deposits ratio	L/Dep	Ratio between loans and deposits	%	+
<i>Independent external variables</i>				
Domestic Debt to GDP	Debt	Domestic Debt to GDP	%	+/-
Inflation	INF	The Harmonized Index of Consumer Prices	%	+/-
Interbank interest rate	EURIBOR	Interbank rate of return on investment in EUR	%	+

Note: All of values are expressed as a percentage

The data for external factors such as (Inflation and Governmental Debt) are collected from Statistical Agency of Kosovo and International Monetary Fund, while data for EURIBOR from official publications of EURIBOR rate.

Table 4.

DESCRIPTIVE STATISTICS

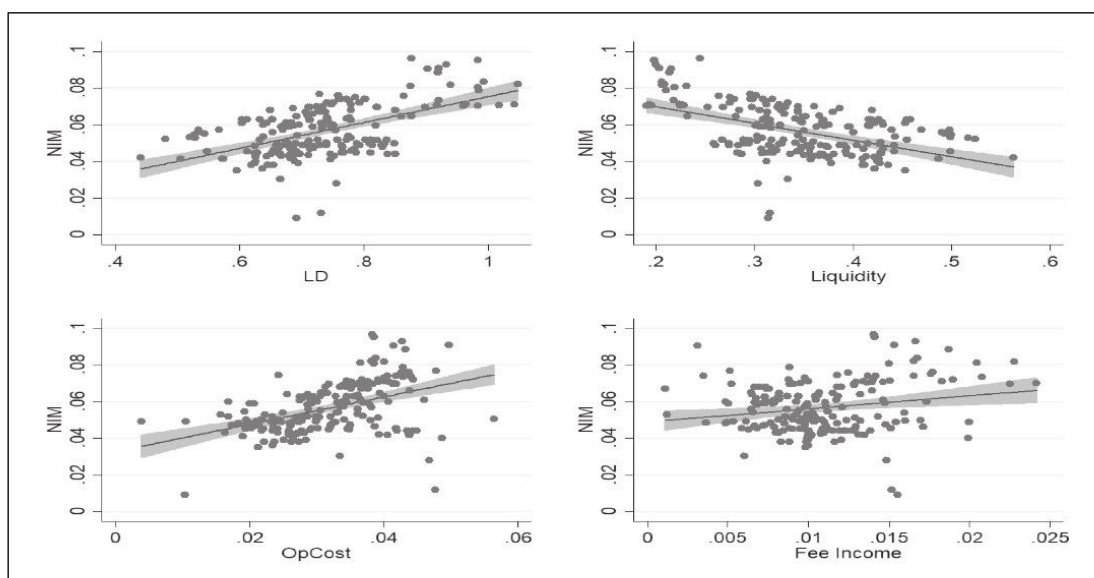
Variable name	Mean	Standard Deviation	Min	Max
NIM	0.057	0.014	0.009	0.096
CAR	0.192	0.246	0.105	0.223
L/DeB	0.733	0.107	0.441	1.047
NPL	0.054	0.027	0.013	0.128
HHI	0.026	0.025	0.001	0.092
Liquidity	0.346	0.075	0.191	0.562
OpCost	0.031	0.009	0.004	0.056
FeeInc	0.011	0.039	0.001	0.024
INF	0.009	0.012	-0.012	0.033
Debt	0.069	0.027	0.0254	0.111
Euribor	0.001	0.003	-0.004	0.0057

Note: The number of observations is 196 representing 7 banks

Table 4 shows descriptive statistics for the estimation sample of seven banks that are being studied from March 2013 to December 2019. The data shows that the average net interest margin is 5.7%, while in 2014 one of banks had a registered minimum of 1.2 % over the three quarters. One bank, being analysed over the first three years, has presented the maximum net interest margin, which was over 9%.

Figure 5.

THE RELATIONSHIP BETWEEN SOME INDEPENDENT VARIABLES
AND THE DEPENDENT VARIABLE



Note: The grey area represents the 95% confidence interval. The green dots represent the number of observations

Figure 5 shows the relationship between some of the independent variables (Loan-to-Deposit Ratio, Liquidity, Operational Costs and Fee Income) and the Net Interest Margin. The grey area represents the 95% confidence interval. The data used for the estimation are well represented since there are not outliers and there is a clear correlation.

Research methodology

Using panel data modelling techniques, the paper attempts to answer the main research question:

What are the effects of internal and external determinants on the net interest margin in the banking sector in Kosovo?

To investigate the impact of internal factors such as: Capital Adequacy (CAR), Credit Risk (NPL), Bank Size (HHI), Credit /Deposit Ratio (L/D), Bank Liquidity (Liquidity), Operating costs (OpCost), commission income (InFee) and external factors such as: Domestic dept to GDP (Dept), Inflation (INF) and EUR (EURIBOR) in the Net Interest Margin (NIM), three econometric approaches were used suitable for the panel data: OLS Regression with standard errors; OLS Regression with cluster standard errors at the bank level and OLS –PCSE (OLS with Panel Corrected Standard Errors).

The main specification of the model is as below:

$$Y_{it} = \beta_0 + \sum_j \beta_j K_{ij} + \varepsilon_{it} \quad (1)$$

where: $i = 1, \dots, 7$ (bank), $t = \text{March 2013} \dots \text{December 2019}$ (quartile), Y_{it} is dependent variable, in this case NIM, K_{ij} are independent variables included in this model, β_j is the parameter that summarizes the contribution of factor j to the dependent variable and ε_{it} is the error term with zero average and constant variance.

According to Beck and Katz (1995), OLS and PCSE is the most suitable version of PCSTS for data sets with a multi-cross-sectional unit and relatively short time series.

OLS with PCSE allows us to estimate coefficients even when encountering unbalanced panels (time series are not equally long for all cross-sectional units).

Basically, the calculation of Estimates is based on an OLS procedure. However, the technique may take into account disturbances in period t that may be related (within panel or in general) to disturbance in period $t-1$. I can also take into account that the disturbance may have different variances (i.e. they are heteroskedastic) between different panels. It can also deal with the problem of a disturbance in one cross-section units at the time related to disturbances in other cross-sectional units at time t .

5. EMPIRICAL RESULTS

The empirical specification that we use in the analysis takes the following form:

$$NIM_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 HHI_{it} + \beta_4 Liquidity_{it} + \beta_5 OpCost_{it} + \beta_6 FeeInc_{it} + \beta_7 L/D_{it} + \beta_8 Debt_{it} + \beta_9 INF_{it} + \beta_{10} EURIBOR_{it} + \varepsilon_{it} \quad (2)$$

Where subscripts i and t stand for bank and quarter, respectively; NIM_{it} is the net interest margin for bank i in period t ; and ε_{it} is the error term.

To estimate equation (2) we use OLS-PSCE regression for the following reasons: First, the observations that characterize the error term for each bank tend to be by default independent across time (autocorrelation). Second, Kosovo is a land lock country and relatively small, therefore, the banks operate in the same market with not a lot of heterogeneity in the industry meaning that the error term will be correlated across banks (contemporaneous correlation). Third, the errors will tend to have different variance across banks therefore, heteroskedasticity is present. To correct for potential problems, it uses OLS-PSCE procedure to estimate equation (1), with premises that this method in the same time corrects for autocorrelation, cross-equation residual correlation, and cross-sectional heteroskedasticity to improve the magnitude of the coefficients. The other difference between OLS-PSCE and OLS is that first instead of presenting t-statistics the analysis depends on z statistics, as a result the OLS-PSCE will generate more accurate z-statistics. Lastly, the same methodology has been used throughout literature, Naser et al. (2014), Papavangjeli and Leka (2016).

Table 5 presents the results of the analysis derived from OLS-PSCE estimation technique. On the left-hand side we present the independent variables described in Section 4. The number of columns represents different equations starting with one variable in column (1) and additional variables in the following columns. In each of the columns we add different independent variables to see whether the effect is solely dependent on a particular variable, or whether this effect is spread with additional variables.

In Appendix we present additional regression results which follow the same logic as in Table 5. The difference is on the methodology applied were we applied OLS with Standard Errors and OLS with clustered standard errors. The results of the tables are similar, where an observation can be drawn that the most persistent effect is the variable L/Dep. Nevertheless, the tables in Appendix have their disadvantages, for instance, when OLS with standard errors is employed, the errors might vary across banks and not within banks and a problem of heteroscedacity might occur. To correct for this, clustered standard errors are used also presented in the Appendix.

Regression Result show that the NLP and CAR coefficients have a negative sign and are statistically significant only in specification (1,2,3) and (4,5,6) respectively. The significance level shrinks when additional control variables are added. The reason why they significant level decreases can be justified by the fact that the level of non-performing loans in the banking sector is very low in Kosovo compared to other countries. Additionally, a further explanation could be that the banking system continues to be characterised by a high capitalization over the

Table 5.

OLS-PCSE PANEL ESTIMATION RESULTS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CAR	0.085*	0.081*	0.164**	0.054	0.047	0.047	0.026	0.015	0.015	-0.013
	(0.048)	(0.048)	(0.067)	(0.039)	(0.039)	(0.039)	(0.035)	(0.034)	(0.034)	(0.036)
NLP		-0.027	-0.02	0.127***	0.089***	0.090**	0.026	0.031	0.023	-0.007
		(0.028)	(0.027)	(0.029)	(0.030)	(0.036)	(0.041)	(0.040)	(0.041)	(0.040)
HHI			-0.126**	-0.037	-0.037	-0.036	0.028	0.044	0.042	0.02
			(0.063)	(0.048)	(0.047)	(0.048)	(0.045)	(0.042)	(0.042)	(0.041)
L/Dep				0.083***	0.082***	0.082***	0.061***	0.070***	0.070***	0.113***
				(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.030)
INF					-0.185***	-0.185***	-0.145**	-0.163***	-0.147**	-0.154***
					(0.065)	(0.065)	(0.057)	(0.058)	(0.060)	(0.059)
EuriBor						-0.02	-0.604**	-0.427	-0.971	-0.82
						(0.286)	(0.271)	(0.278)	(0.610)	(0.617)
OPCost							0.643***	0.680***	0.667***	0.687***
							(0.110)	(0.110)	(0.111)	(0.107)
FeeIncome								-0.534**	-0.531**	-0.568**
								(0.245)	(0.243)	(0.244)
Debt									-0.074	-0.082
									(0.072)	(0.072)
Liquidty										0.066
										(0.041)
Constant	0.043***	0.045***	0.034***	-0.019***	-0.013*	-0.013*	-0.013*	-0.014**	-0.008	-0.055*
	(0.008)	(0.008)	(0.010)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.033)
Observations	196	196	196	196	196	196	196	196	196	196
R-squared	0.022	0.025	0.053	0.345	0.364	0.364	0.455	0.47	0.472	0.48
Number of Banks	7	7	7	7	7	7	7	7	7	7

Notes: Standard Errors in Parenthesis. *** denotes 1% significance level, ** 5% significance level and * 1% significance level.

years. Similar results are found in other studies such as Papavangjeli and Leka (2016) in the banking sector in Albania, Knesevis and Dobromirov (2016) in the banking sector in Serbia.

Regression result for Hirschman Index HHI, which represents the concentration of banks' assets in relation to total assets in the market, turns out to be positive throughout different specifications but significance level is weak and only presented in Specification (3). Similar results were found by Yilmaz (2017) and Papavangjeli and Leka (2016).

The coefficient of Loan-to-deposit ratio (L/Dep) is positive sign and significant throughout all of the specifications. Additionally, the magnitude of the coefficient is relatively stable meaning that it does not differ a lot when control variables are added. This expected result is justified by the current level of the loan to deposit ratio, which is close to 80% showing that loans in the banking sector in Kosovo are entirely financed by deposits. Whereas, deposits without the need for interbank financing can finance the loan, this correlation is expected because a loan portfolio growth leads to an interest income and at the same time reduction of liquidity in banks. The impact of financing rate on the net interest margin can be assessed differently by different countries, depending on the source of the loan financing. Similar results with high significance and positive sign were found in the research of the impact of determinants on the net interest margin in banks of Central and Eastern Europe (Dumičić & Ridzak, 2013).

The empirical result show that operating costs are identified as a very important factor with a positive impact on the net interest margin. These results are in line with other studies which confirm that banks increase interest margin when operating costs are increased, Papavangjeli and Leka (2016) for Albania, Dumičić and Ridzak (2013) for Central and Eastern Europe and Yilmaz (2017) for Turkey etc. Findings by Nassar et al., (2014), show that there is a correlation between borrowing cost and interest rate. The argumentation follows that the larger the cost of monitoring, the higher would be the interest rate. Nevertheless, since Kosovo's NPL is low the operation cost could be because of inefficiency of banks and low productivity. In their study, they show that banks that focus on retail operations usually face higher operating costs than those focused on wholesale operations or financial markets. The retail sector requires many branches and a fee of sales agents, therefore this is translated in increased operational costs of borrowing which directly impacts the NIM.

The relationship between FeeIncome (commission income in relation to interest bearing assets) and NIM is negative and statistically significant has resulted as a statistically significant variable but with a negative impact on the net interest margin. In the banking sector, there has been a substitution effect, where the income is being generated more from fees (such as commission, transfer fees, main-

tenance fee) than from interest. The same trend is being adopted in the banking sector in Kosovo. This in turn has led banks to create different revenue channels where they started to offer new banking services. Compared to developed markets where the net interest margin is close to zero, in Kosovo this is not the case. Therefore, there is a strong negative correlation between these variables, where an increase of commission income reduces interest margins. This is also shown in by Dumičić and Ridzak (2013) and Claeys and Vennet (2008).

The paper also explores the external determinants, on whether they have an impact on NIM, such as EURIBOR, Inflation, and Debt Level. The NIM does not depend on EURIBOR or in the debt level of the country

Findings suggest that inflation rate contributes to reduce the bank margin. The results could be explained by the fact that the interest rate on liabilities are adjusted faster from the inflation rate than the assets which leads to a negative relationship between two variables. Kosovo operates with EUR currency, and most the interest received/paid on the liquid assets in banking sector is depended on the interest paid/received from the international market, while the interest rate in loans is not adjustable as fast as on the deposit side. The similar result has been found on study for the determinants of banks in NIM on EURO Area by Angori et al., (2019).

6. CONCLUSIONS

Over the last two decades, the banking sector has experienced major global transformations in its operating environment. Both external and internal factors had an influence on its structure and performance.

This paper studies the internal and external factors that influence the net interest margin in the banking sector in Kosovo.

The results of OLS with PCSE procedure confirm that the net interest margin in the banking sector in Kosovo is mostly influenced by internal factors (L/Dep, OPCost, and Fee Income) and from other market specifics but not much influenced by external factors except for the impact of inflation.

The results show that there is a significant positive relationship between the Loan to Deposit Ratio and the net interest margin of the banks analysed in Kosovo, therefore, any increase in the loan to deposit ratio to the extent that interbank financing is not necessary, would lead banks to increase the net interest margin. A strong positive relationship between operational costs and net interest margin has been observed. The reason is the specific market, where banks are service oriented and

require high operating costs to meet market needs. The result suggests that higher operational cost imply higher interest rate which is shown by our regression results.

Fee income has also shown a significant impact on net interest margin and are surveying as a substitute for interest income. Considering the results obtained in this research, banks in Kosovo should look on the direction to reduce their operating costs, increase their loan-to-deposit ratio by offering more loans, and optimize fee incomes in order to increase income, which would directly affect the current preservation level of net interest margin or its optimization.

The data of this research can be considered preliminary due to the short database of seven years. Similar results, although with high significance and same data can be found in research carried out for small banks and developing countries, by the authors Kasman et al., (2010), Brock and Suarez, (2000), etc.

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DETERMINANTE NETO KAMATNE MARŽE POSLOVNIH BANAKA NA KOSOVU

Sažetak

Cilj ovog rada je istražiti unutarnje i vanjske determinante koje utječu na neto kamatnu maržu (NIM). Rad koristi proceduru OLS-PSCE koristeći tromjesečne podatke panela (od ožujka 2013. do prosinca 2019.) za poslovne banke na Kosovu. Rezultati pokazuju da je neto kamatna marža u bankarskom sektoru na Kosovu uglavnom pod utjecajem čimbenika unutar banke kao što su: omjer kredita i depozita i operativnih troškova i prihodi od naknada, ali manje pod utjecajem vanjskih čimbenika osim inflacije. Osim toga, rezultati sugeriraju da vanjski čimbenici ne utječu na neto kamatnu maržu; stoga intervencija vladine politike možda neće imati utjecaja na neto kamatnu maržu. Rezultati istraživanja važni su za poslovne banke na Kosovu, jer mogu pomoći u poboljšanju učinkovitosti kroz interne i vanjske pokazatelje koji utječu na NIM.

Ključne riječi: Neto kamatne marže, omjer zajma i depozita, operativni troškovi, prihod od naknada, likvidnost, kreditni rizik, inflacija.

APPENDIX

Appendix 1.

OLS REGRESSION WITH STANDARD ERRORS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CAR	0.085** (0.040)	0.081** (0.041)	0.164*** (0.053)	0.054 (0.046)	0.047 (0.045)	0.047 (0.046)	0.026 (0.043)	0.015 (0.043)	0.015 (0.043)	-0.013 (0.046)
NLP		-0.027 (0.037)	-0.02 (0.037)	0.127*** (0.035)	0.089** (0.038)	0.090* (0.049)	0.026 (0.047)	0.031 (0.047)	0.023 (0.048)	-0.007 (0.051)
HHI			-0.126** (0.053)	-0.037 (0.045)	-0.037 (0.044)	-0.036 (0.045)	0.028 (0.044)	0.044 (0.044)	0.042 (0.044)	0.02 (0.046)
L/Dep				0.083*** (0.009)	0.082*** (0.009)	0.082*** (0.009)	0.061*** (0.009)	0.070*** (0.010)	0.070*** (0.010)	0.113*** (0.028)
INF					-0.185** (0.078)	-0.185** (0.079)	-0.145** (0.074)	-0.163** (0.073)	-0.147* (0.076)	-0.154** (0.076)
EuriBor						-0.02 (0.373)	-0.604* (0.361)	-0.427 (0.365)	-0.971 (0.754)	-0.82 (0.756)
OpCost							0.643*** (0.114)	0.680*** (0.114)	0.667*** (0.116)	0.687*** (0.116)
FeeInc								-0.534** (0.231)	-0.531** (0.231)	-0.568** (0.231)
Dept									-0.074 (0.090)	-0.082 (0.090)
Liquidity										0.066 (0.041)
Constant	0.043*** (0.007)	0.045*** (0.007)	0.034*** (0.008)	-0.019** (0.009)	-0.013 (0.009)	-0.013 (0.009)	-0.013 (0.009)	-0.014* (0.009)	-0.008 (0.011)	-0.055* (0.031)
Observations	196	196	196	196	196	196	196	196	196	196
R-squared	0.022	0.025	0.053	0.345	0.364	0.364	0.455	0.47	0.472	0.48

Note: Standard errors in parenthesis. Significance level *** P<0.01, **P<0.05, *P<0.1

Appendix 2.

OLS REGRESSION WITH CLUSTER STANDARD ERRORS AT THE BANK LEVEL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
CAR	0.085	0.081	0.164	0.054	0.047	0.047	0.026	0.015	0.015	-0.013
	(0.072)	(0.068)	(0.086)	(0.090)	(0.094)	(0.083)	(0.072)	(0.075)	(0.076)	(0.069)
NLP		-0.027	-0.02	0.127	0.089	0.09	0.026	0.031	0.023	-0.007
		(0.067)	(0.071)	(0.081)	(0.083)	(0.076)	(0.043)	(0.041)	(0.050)	(0.048)
HHI			-0.126	-0.037	-0.037	-0.036	0.028	0.044	0.042	0.02
			(0.103)	(0.120)	(0.119)	(0.108)	(0.107)	(0.107)	(0.105)	(0.116)
L/Dep				0.083***	0.082***	0.082***	0.061**	0.070***	0.070***	0.113***
				(0.018)	(0.017)	(0.017)	(0.020)	(0.016)	(0.016)	(0.018)
INF					-0.185*	-0.185	-0.145	-0.163	-0.147	-0.154
					(0.089)	(0.110)	(0.098)	(0.093)	(0.087)	(0.085)
EuriBor						-0.02	-0.604	-0.427	-0.971	-0.82
						(0.946)	(0.993)	(0.937)	(1.030)	(0.983)
OpCost							0.643**	0.680**	0.667**	0.687**
							(0.220)	(0.224)	(0.233)	(0.236)
FeeInc								-0.534*	-0.531*	-0.568*
								(0.235)	(0.224)	(0.238)
Debt									-0.074	-0.082
									(0.103)	(0.099)
Liquidity										0.066
										(0.039)
Constant	0.043**	0.045***	0.034***	-0.019	-0.013	-0.013	-0.013	-0.014	-0.008	-0.055
	(0.012)	(0.011)	(0.009)	(0.011)	(0.011)	(0.012)	(0.010)	(0.009)	(0.017)	(0.035)
Observations	196	196	196	196	196	196	196	196	196	196
R-squared	0.022	0.025	0.053	0.345	0.364	0.364	0.455	0.47	0.472	0.48

Note: Clustered standard errors in parenthesis. Significance level *** P<0.01, **P<0.05, *P<0.1