THE DETERMINANTS OF BANKS' PROFITABILITY: EVIDENCE FROM CEMAC COUNTRIES

Dalia Ayme Opoko Apendi

School of Finance, Dongbei University of Finance and Economics, China

Jean Baptiste Bernard Pea-Assounga

School of Economics, Anhui University, China

Wang Xiaofeng

School of Finance, Dongbei University of Finance and Economics, China

ABSTRACT

This study investigated the determinants of commercial bank's profitability in CEMAC countries during the period 2005-2014. As sample data, we selected 33 commercial banks of the six countries of Central African Monetary and Economic Community (CEMAC). ROA is considered as a measure of bank profitability, the internal factors (size, capital adequacy ratio, deposit growth, indirect costs, and credit risk) and external factors or macroeconomic factors (GDP and inflation) are used as explanatory variables. The regression analysis was performed using Panel Least Square (PLS) method in Eviews 7.2 package. The results show that credit risk and overheads are the main determinants of commercial bank's profitability of the CEMAC countries. At the same time, we also found that macroeconomic factors such as GDP influence negatively bank's profitability. In addition, CEMAC's countries banking profitability is not affected by the fluctuations in inflation.

Key Words: CEMAC countries, Bank's profitability, internal factors, external factors

1. INTRODUCTION

The role essential of the financial system is to facilitate the economic operations. Banks plays a very important role in transferring funds from savers to the investors. The efficiency of a

financial system is shown by its profitability, the increase in the volume of funds flowing from savers to borrowers, and a better quality of service to customers. As a financial intermediary, banks contribute to the economic growth of a country, by making available funds for investments and providing financial deepening. Accordingly to Bashir (2003), the task of providing funds to the economy makes banks performance an important element of any country, therefore examining the factors drives their profitability is necessary for the strength of the economy.

The operating environment of banks in the world has undergone worldwide major transformations during the last decades. Banks performance and structure have been affected by both internal and external factors. Despite the poor performance of banks in many countries, the role of banks has remained the same central in financing economic activities. A sound and profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou, Brissimis, & Delis, 2008).

Bank performance has raised a lot of debates in the world. The debates have been conducted in the direction of policies to effectively improve the performance banks. Some scholars argue that banks internal factors (management efficiency) are the main factors driving banks profitability; others argue that industry-specific factors are important determinants of banks' profitability. Another group of scholars argues that more attention should be given to macroeconomic factors when explaining the variability of bank profitability. More recent studies have shown that both internal and external factors have affected bank's structure and performance. In this paper, the main objective is to investigate the determinant of banks' profitability in CEMAC countries.

Problem statement and justification

Banks' performance has attracted the attention of many researchers in the world in over years. The researchers have been focused on the factors that drive the profitability of banks, with the goal to suggest policies for the improvement of their performance and to avoid the collapse of this important sector. A big part of the researchers find that both, bank's internal (management decisions) and external (environment) factors affect bank's profitability. The review of the previous studies on the determinants of bank's performance have shown that extensive studies on the determinants of bank's profitability has been conducted in developed countries, a few in developing countries, and limitedly in Africa

Furthermore, as the previous studies propose, we might need more balanced information on the determinants of bank profitability in order to increase the understanding of the factors that affect banks' profitability. It appears that for all we have studied, the researcher have made some recommendations for policies to improve the performance of banks but the performance of banks in many countries has not considerably improved. Comparing to others developing countries, the financial depth, the access to financial services, and the credit to private agencies in CEMAC countries is very low, not improving over the years. The performance of commercial banks has been poor, characterized by low levels of credit to private sector, high-interest rate spreads, and high levels of non-performing loans, poor asset quality, and operational inefficiencies, among

others. For example in 2014, less than 3 percent of the population obtained bank loans and only 7.5 percent of adults had a saving account (IMF report 2015). This is one of the factors restraining the economic development of those countries. Extensive studies on the determinants of bank profitability in CEMAC countries are therefore important in order to propose solutions for the improvement of performance in the banking sector.

According to Rajan & Zingales (1998), Levine (1998), the well-being of the banking sector contribute to the economic growth, the knowledge of the factors that influence bank profitability is therefore very important not only for managers of the banks, but also for numerous stakeholders such as central banks, bankers associations, governments, and other financial authorities. Thus; this study seeks to analyze the impact of bank internal and external factors on bank profitability (ROE and ROE) in CEMAC countries with the aim to inform the policymakers such as Central Bank and commercial bank managers about the factors that influence the profitability of banks and this will also be useful when making future macroeconomic and managerial decisions for the improvement of bank performance in CEMAC countries.

2. LITERATURE REVIEW

In order to understand better the determinants of bank profitability in CEMAC countries, it is always necessary to go through the previous studies.

Bank profitability has been subject of many researches in the world. A big part of the searchers concluded that bank profitability is function of internal and external factors. Pasiouras & Kosmidou (2007) found that the profitability of both domestic and foreign banks in the European Union is influenced by bank's specific factors and also by the financial market structure and macroeconomic factors. In addition, Petria et al. (2015) assessed the determinants of bank's profitability in 27 countries of European Union over the period 2004-2011 using time series data as well. The results of their study indicate that credit risk and liquidity risk, management efficiency, diversification of business, market concentration and competition, the economic growth affect bank performance (ROA and ROE).

Beside, Hoffmann (2011) conducted a study on the determinants of bank profitability in United States banking industry during the period 1995-2007. The variables used are size, concentration, loan capacity, interest expenses, investment in securities, bank risk, and a series of control variables like USA Federal Reserve Bank Discount rate, bank index. The outcome revealed a negative relationship between capital ratio and bank profitability.

Athanasoglou et al. (2008) investigated the impact of bank specific, industry-specific and macroeconomic determinant on bank profitability in Greece during the period 1989-2001. The study found that all bank-specific determinants, with the exception of size, affect bank profitability. They also found that business cycle had a positive impact on bank profitability, but business cycle and bank profitability (return on asset) had a significant relationship only in the upper phase of the cycle.

Alper & Anbar (2011) examined the bank-specific and macroeconomic determinants of bank profitability in Turkey over the period 2002-2010. Balanced panel dataset was utilized for the study and the results revealed that the asset size and noninterest income have a positive relationship with (ROA and ROE). Another result of the study was that the size of credit portfolio and loans under follow up are negatively related to bank profitability.

On the other hand, a study was conducted by Sufian (2009) to investigate the determinants bank's profitability in China banking sector over a period of 8 years, from 2000-2007. The sample size of the study included four State Owned Commercial banks and 12 Stock. Through a multivariate regression analysis, the results indicated that size, credit risk, and capitalization affect positively bank profitability in China and liquidity, overhead costs and network had a negative effect on bank profitability. Another result from this study was that economic growth and inflation impact positively bank profitability. Nevertheless, Gul et al. (2011) examined the relationship between bank-specific and macroeconomic characteristic over bank profitability of fifteen banks of Pakistan during the period 2005-2009. They used pooled ordinary least square (POLS) method and they found that both internal and external factors strongly influence bank profitability, whether bank returns (ROE, ROE, and Return on Capital employed) or net interest margin. They concluded that banks that have high capital, total asset, loans, deposits and macroeconomic factors (GDP growth, inflation, and stock market capitalization) tend to be safer, and this leads high-profit level.

TANIMOUNE (2001) focused his study on "the determinants of banks' profitability in West African Economic and Monetary Union (UEMOA)". He worked on seven (7) out of the nine (9) countries that count the UEMOA countries (Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal, and Togo). He used two measures of bank profitability net interest margin and the net interest margin widened to measure interest margins and as explanatory variables customer's loans to total asset ratio; Customer deposits to total assets ratio; Overhead to total assets ratio; doubtful debts to the total assets ratio; GDP and inflation were used. He found a positive influence of the overheads on the profitability of banks and a negative influence on the other variables.

Another study on the determinants of bank profitability was conducted by Naceur (2003), the study focused on the Tunisians banking industry and it covered the period 1980-2000. By employing feasible generalized least squares (FGLS) method for the regression analysis on balanced panel data, this study indicated that interest margin and return on asset were positively associated with capital and overheads. Bank loans affected positively bank's interest margin and size had a negative influence on bank interest margin. The external factors such as GDP and inflation had no impact on bank profitability. However, financial structure was less beneficial to the bank's profitability than the competition; stock market development had a positive impact on bank's profitability.

Mansouri and Afroukh (2009) conducted their work on the determinants of bank profitability in Morocco. Seemingly Unrelated Regression method (SUR) was employed for the regression

analysis on panel data. They found that the majority of managerial variables (operating expenses, bank loans, the bank's size and equity) influenced positively the profitability of banks. Among the managerial factors, only bank size had a negative effect on banks profitability. Concerning the macro-financial variables, concentration and financial market developments had a positive impact on the profitability of assets. Inflation and economic growth had a positive effect on bank profitability.

On the other hand, Lipunga (2014) evaluated the determinants of bank profitability in developing countries especially Malawi over the period 2009-2012. The results of his study indicated that bank size, liquidity. While management efficiency have a significant impact on bank profitability ROA and the impact on capital adequacy on bank return on asset is insignificant in Malawi banking system. However, size, capital adequacy, management efficiency and liquidity significantly influenced the Earning yield of banks.

Besides, Frederick (2014) studied the factors that affect the domestic commercial banks profitability in Uganda spanning the period 2000-2011. Structure-conduct performance (SCP), efficiency hypothesizes (ES) and a linear multiple regression analysis were employed for the study. He found that management efficiency, interest income, asset quality, capital adequacy, and inflation are the factors that influence the profitability of banks in Uganda.

Osuagwu1 (2014) investigated the determinants of bank profitability in Nigeria during the study period 1980-2010. Using generalized least squares, the results of this study reveal that credit risk and other factors strongly affect bank profitability; however, the market concentration had a significant impact on bank performance. Moreover, there was a significant relationship between exchange rate and banks return on equity and noninterest margin but don't affect bank return on asset.

Munyambonera (2013a) focused his study on the determinant of bank profitability in Sub-Saharan African countries during the period of 1999-2006. He used cost efficiency model and random effect estimator for the regression analysis. The author found that bank-specific factors and macroeconomic factors explained the variation of bank's return on asset in Sub-Saharan African countries. Bank specific such as growth in deposit, capital ratio influence positively bank profitability and on another hand growth in bank asset, operational efficiency and bank liquidity impacted negatively bank profitability. GDP and inflation had a negative influence on bank profitability.

Overall, extensive studies on the determinants of banks' profitability have been conducted in developed countries, a few in developing countries and limitedly in Africa. In some African countries, such as CEMAC countries the studies on banks profitability are still very few or almost inexistent. However, the studies on the determinants of banks' profitability in Africa are limited in terms of scope; the majority of studies have been focused on a particular country. The main contribution of this study is therefore, to investigate the determinant of bank profitability using 6 countries of CEMAC during the period 2005-2014.

3. RESEARCH METHODOLOGY

3.1 Data and variables definition

Secondary data were used to reach the objective of this study. The data of banks were drawn from the financial statement of respective banks provided by bank scope database and the bank's website. Thus, the macroeconomics data were collected from World Bank database. As sample, 33 commercial banks were selected for the analysis and the study covered the period 2005-2014. Using statistical package, Eviews 7.2 software, the collected panel data were analyzed using the descriptive statistics and multiple regressions. Furthermore, before the regression analysis, we first tested for stationarity of the panel using unit root test for unbalanced panels, then secondly we tested for correlation between variables and thirdly we tested for multicollinearity.

According to the literature, the following variables were selected for the analysis:

➢ **Dependent variable**

Following Naceur (2003), Athanasoglou et al. (2008), Munyambonera (2013a), Petria et al. (2015), the dependent variable used in this study is return on asset (ROA). ROA is one of the profitability measures that have been mostly used in studies on the determinants of bank profitability. This ratio gives information such as how profitable a company is relative to its assets. It is computed by dividing net incomes of a bank by its total assets.

➢ **Independent variables**

In this study, the independent variables used to explain the profitability of banks are grouped into two groups: bank's internal factors or bank-specific and bank's external factors. The internal factors included in the study are size; growth in deposit, capital adequacy, overheads to total assets ratio and credit risk and the external factors used are the macroeconomic factors such as GDP and inflation.

Bank's size (lnTA) is one of the determinants of bank profitability that has been commonly used in most studies. Sufian (2009), Mansouri and Afroukh (2009), Alper & Anbar (2011) found a positive relationship between size and bank's profitability; bigger size creates economies of scale, therefore an increase in bank's profit. In contrary, others searchers such as Pasiouras & Kosmidou (2007), Munyambonera (2013a), found that size affect negatively bank's profitability, this indicates the diseconomies of scales. Size is usually computed as logarithm of total assets.

Capital adequacy (CapAd) computed by equity to total assets is utilized to gives information about the way bank's assets are financed and the ability of the bank to deal with losses. Accordingly to Athanasoglou et al. (2008), the higher capital level may have a positive effect on performance since by having more capital a bank can easily adhere to regulatory capital standards thus that excess capital can be provided as loans. On the other hand, Hoffmann (2011) found opposite results and concluded that it could be because banks are operating over-cautiously and ignoring potentially profitable trading opportunities.

Growths in deposits (lnTD), deposits are the main source of bank funds. Banks transform deposits into loans and loans are considered as the main source of bank's income, hence the changes on deposits may have an impact on banks profitability. Growth in deposits is represented by the natural logarithm of deposits. Some authors such as Munyambonera (2013a), Sufian (2009) found a positive relationship between growth in deposit and bank profitability.

The overheads ratio (OvTA) is computed by dividing overhead to total assets, is used to provide the information on the variation in bank operating cost (total amount of wages and salary...) over the time. Bourke (1989) among others argues that the reduction of expenses improves the efficiency, and this leads to an increase of bank profitability, meaning there is a negative relationship between operating expenses and profitability. However, Molyneux & Thornton (1992) found a positive relationship, suggesting that firm high profit earned by a firm may be appropriated in the form of higher payroll expenditures. Asli Demirguc-Kunt and Harry Huizinga (2000) observed that even though overstaffing may lead to the low level of bank profitability in low-income countries, but the same theory cannot be applied for banks operating in middle and high-income countries.

Credit risk (CR) is utilized to measures the changes in banks loan quality and risks. It is calculated by dividing loan loss provision to total loans. It is one of the main factors that affect bank profitability; it shows the probability of loss because of the failure of the debtor to pay back its obligations to the bank. Petria et al. (2015), Lipunga (2014) among others found that credit risk strongly affects negatively bank's profitability.

GDP (per capita) was used to give the information about the growth of economic activity of those countries. The profitability of banks is sensitive to the economic conditions despite the trend in the industry toward greater diversification and larger use of financial engineering to manage the risk associated to the forecasting of the business cycle. The increase of economic activities has a positive impact on bank activity since it is manifested by an increase in customer deposits, loans and interest margin vice versa (Naceur 2003).

Inflation (Inf) is characterized by an increase of prices in the market. Asli Demirguc-Kunt and Harry Huizinga (2000), Athanasoglou et al. (2008), Sufian (2009) among others find out that inflation has a positive impact on bank profitability. However, higher anticipated inflation leads to higher loan interest rates, thus to an increase of bank's profitability.

3.2 Model specification

For examining the impact of bank internal and external factors on bank profitability in CEMAC countries, the following model was estimated:

$$\pi_{it} = \alpha + \beta_i\, X_{it} + \varepsilon_{it} \qquad (1)$$

Where,

π_{it} represents the profitability of a bank i at time t, with $i = 1,2 \ldots, N$; $t = 1,2,\ldots, T$;

α is a constant term, the intercept of

the equation;

β_i is the coefficient; it measures the influence of independent variables on the dependent variable;

X_{it} represents the independent or explanatory variables;

ε_{it} is the error term.

By using the function of profitability equation and taking into consideration the variables notation, the model is as follow:

$$Prof_{it} = \alpha + \beta_1\,Size_{it} + \beta_2 CapAd_{it} + \beta_3 lnTD_{it} + \beta_4 OvTA_{it} + \beta_5 CR_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \varepsilon_{it} \quad (2)$$

Where $Prof_{it}$ is the two profitability variables represented either by return on asset (ROA) of a bank i at time t ; and Size, CapAd, lnTD, OvTA, CR, GDP, INF represent respectively the independents variables of bank i at a time t and ε_{it} the error term.

4. ANALYSIS AND RESULTS

4.1 Summary statistics of the variables

Table 2 provides the descriptive statistic of both dependent and independent variables. According to the descriptive statistics, ROA had a mean value of 1.278, a minimum of minus 32.976 and a maximum of 29.549. From this measures variation, we can notice that there is a large difference in profitability across banks and some banks have experienced losses during the study period 2005-2014. The standard deviation of ROA is 3.522; this indicates that on average the bank in CEMAC has a return on asset more close to the mean value 1.278. Size had a mean value of 11.888, a minimum value of 9.339 and a maximum value 14.152; this indicate that there is a difference of size among banks, the standard deviation of size is 1.01 which means that on average the banks in CEMAC countries have a size close the mean value 11.888.

Table1: Summary statistics of the variables

Variables	Obs	Mean	Std. Dev	Min	Max
ROA	244	1.278	3.522	-32.976	29.549
lnTA	244	11.888	1.015	9.339	14.152
CapAd	244	10.144	.763	-45.444	73.665
lnTD	244	11.431	1.637	2.603	13.998
OvTA	244	5.312	3.265	1.129	20.736
CR	244	1.602	5.961	-46.846	60.543
GDP	244	1.091	5.101	-37.925	14.293
Infl	244	3.078	3.328	-8.975	14.018

Source: Bank scope and World Bank

4.2 Stationarity test

The results of the test of stationarity are listed in table 2. Brooks (2008) stated that the use of non-stationary data can lead to spurious regression results. This study used a test proposed by Maddala and Wu (1999).

It is a Fisher type test based on augmented Dickey- Fuller (ADF) tests which are made of the combination of the p-value from the test of unit root for each banks. It performs better than others Unit root test, and also it has an advantage because, it doesn't require like others the use of balanced panel data. For all variables the null hypothesis was rejected (Ho: all panels contain unit root or are non-stationary) and we accepted the alternative hypothesis (Ha: the panel is stationary) at 0.01, 0.05 and 0.1 significance level.

Table 2 Panel Unit root test

variables	Level			
	ADF Fisher chi-square		ADF Fisher choi Z-statistic	
	statistic	Prob.	statistic	Prob.
ROA	75.887	0.0005*	3.533	0.0002*
lnTA	57.057	0.0392**	-2.330	0.0099*
CapAd	84.735	0.0004*	-3.002	0.0013
lnTD	53.122	0.080***	-2.019	0.0217**
OvTA	80.683	0.0000*	-4.398	0.0001*
CR	73.875	0.0009*	-3.135	0.0009*
GDP	81.92	0.0000*	-4.351	0.0001*
Infl	126.46	0.0000*	-6.667	0.0000*

All the results are based on test equation with intercept. Optimum lag lengths are selected based on Schwartz Criterion. *significant at 0.01, **significant at 0.05, ***significant at 0.1

Source: Bankscope and World Bank data

Looking at the result, all the statistics and their p-value are smaller than the significance levels for all variables, we can conclude that there are no unit roots in the panel; therefore all variables are stationary at level data. The existing literature indicates that when the panel variables are stationary; they are as well integrated and could generate one co-integration relationship. The results prove that the bank-specific variables: size, Capital adequacy, growth in deposit, overhead to total assets ratio, credit risk and the macroeconomic variables: GDP and inflation are efficient in explaining bank profitability in the CEMAC countries over the period 2005-2014.

4.3 Correlation test

The test of correlation was used to examine the relationship between dependent and independent variables. The correlation coefficient r lies between -1 and 1. A positive value means there is a positive relationship between the variables and the negative value means there is a negative relationship between variables. Table 3 summarizes the correlation between the dependent variable (return on asset) and the independent variables.

Table 3 Correlation test

	ROA	lnTA	lnTD	CapAd	OvTA	CR	GDP	Inf
ROA	1							
lnTA	0.13	1						
lnTD	0.12	0.835	1					
CapAd	-0.058	-0.285	0.449	1				
OvTA	-0.393	-0.369	-0.319	0.479	1			
CR	-0.812	-0.108	-0.125	-0.063	0.181	1		
GDP	0.056	0.087	0.051	-0.048	-0.095	-0.137	1	
Infl	0.038	0.076	0.024	-0.015	0.025	-0.014	0.05	1

Source: Bankscope and World Bank data

From this table, we can see that size, deposit growth, GDP, and inflation are positively correlated with bank return on asset. While overhead total asset, credit risk and capital adequacy are negatively correlated. Among the dependent variables, credit risk is the most correlated with both dependent variables.

However, looking at the independent variables among themselves from this table makes us notice that size is strongly correlated to grow in deposit (lnTD). The level of correlation between the two variables is 0.835. This strong correlation between the two independent variables, made us check the existence of multicollinearity in our model. For us to be sure and to avoid this problem we conducted a multicollinearity test.

The results of the multicollinearity test are presented in Table 4. Accordingly, to the results, there was no multicollinearity in our model. The mean VIF was 2.08 and the maximum VIF was 4.22. Both the mean value and the maximum value were below the VIF cut-off point of 10, for the model to be characterized by multicollinearity. However the tolerance value were all above 0.1, the recommended cut off below with the multicollinearity is considered as a problem. Therefore, we concluded that the variables in the model present a linear combination of the independent and dependent variables.

Table 4: Multicollinearity

	VIF	Tolerance
lnTA	3.87	0.2581
lnTD	4.22	0.2371
CapAd	1.72	0.580
OvTA	1.55	0.6451
CR	1.12	0.8943
GDP	1.04	0.966
Infl	1.02	0.983
Mean value	2.08	

Source:Bankscope and World Bank data

4.4 Regression analysis

Hausman specification test was conducted to choose the appropriate estimator for this study. Table 5, presents the results of the Hausman specification test. According to the results fixed effect model is better than random effect model for the regression analysis, we rejected the null hypothesis (H_0: the random effect is appropriate) with a p-value of 0. 0243 smaller than 0.05 significance level, and accepted the alternative hypothesis (H_a: fixed effect is appropriate.

Table 5 Hausman test

Test summary	Chi-Sq statistic	Chi-sq.df	Prob .
Cross-section random	16.093	7	0.0243**

**significant at 0.05

Source: Bankscope data and WorldBank data

The results of the fixed effect regression are summarized in Table 6. The findings show that the Adjusted R-squared was 0.760 which indicates that about 76% of the variability in profitability is explained by the selected explanatory variables. In addition, the value of F-statistic was 20.738

with a probability of 0.0000 and statistically significant at 1% level. This indicates that the explanatory variables jointly have a significant impact on the profitability of banks in CEMAC countries. Durbin-Watson statistic was 1.97, approaching the critical value 2; which means that there was no autocorrelation in the model. Accordingly, to the results size had a positive and statistically significant relationship with profitability. This implies that the bigger the bank is, the more economies of scale and hence more profitable as well. The possible reason is that larger banks have economies of scale and lower variance of earnings which resulted in profitability. Besides, many previous studies indicated a similarly significant positive relationship, such as Sufian (2009), Gul et al. (2011), Almazari (2013), Petria et al. (2015).

The findings indicated that growth in deposit had a negative and statistically significant impact on profitability. This result is consistent with Sufian (2009), Dietrich & Wanzenried (2011). It indicates that the banks in CEMAC countries were not able to convert the increasing amount of deposit liabilities into significantly higher earnings income during the study period. Capital Adequacy had a negative relationship with profitability, and statistically insignificant. The similar result was obtained by (Gul et al., 2011), (Almazari, 2013) who find that well-capitalized banks experience negative returns, but the relationship between return on asset and capital adequacy is not conclusive because of the insignificant relationship between the two variables. Besides, the results can be explained by the poor quality of assets in CEMAC countries, the weakness of the operational performance of the assets that participate in normal operations of the banks, led to a low rate of exploiting resources and reflected negatively on the degree of capital adequacy. According to Athanasoglou et al. (2008), this argument claims that lower capital ratios imply a risky position, which leads to the indication of a negative relationship between capital ratios and profitability.

In addition, overhead to total asset ratio has a negative and significant relationship with return on assets. These results are consistent with the previous studies such as Berger et al. (2001), Asli Demirguc-Kunt and Harry Huizinga (2000) Pasiouras & Kosmidou (2007), Sufian (2009) among others, supporting the theory that poor expenses management is one of the main factors contributing to the low level of profitability.Credit risk measured by loan loss provision to loans had a negative relationship with return on asset and statistically significant. These findings are in line with Athanasoglou et al. (2008)**,** Petria et al. (2015)**,** and suggest that in the CEMAC banking system, the central bank has adopted policies which involve the forecasting of future level of risk. Therefore, banks attempt to maximize profit by improving screening and monitoring credit risk.

Table 6 Regression results

Variables	Coef	Std. Error	t- Statistic	Probability
C	-0.203	3.285	-0.062	0.9508
lnTA	1.114	0.398	2.798	0.0056*
lnTD	-0.695	0.298	-2.337	0.0208**
CapAd	-0.028	0.019	-1.444	0.1504
OvTA	-0.271	0.070	-3.860	0.0002*
CR	-0.490	0.023	-21.187	0.0000*
logGDP	0.883	0.478	-1.847	0.0662***
Infl	0.004	0.034	0.121	0.9037
R-squared	0.799			
Adjusted R-squared	0.760			
F-statistic	20.738			
Durbin-Watson	1.970			0.0000

*significant at 0.01, **significant at 0.05, ***significant at 0.1

Source: Bankscope and WorldBank data

Likewise, GDP per capital had a negative and statistically significant relationship with return on asset. This result also shows that an increase in GDP per capital has a negative impact on profitability of CEMAC banking industry. This support the earlier studies Athanasoglou et al. (2008), Munyambonera (2013a), which find that the relationship between GDP grow and bank profitability could be cyclical. There are several reasons which demonstrate that the effect of growth in GDP could be positive or negative. One of the reasons is that bank credit could decrease during the economic slowdown since such period is most of the time associated with risk and vice versa. Inflation had a positive and statistically non-significant relationship with profitability. This implies that, when the inflation rate increases, the profit of banks tend to increase as well, but due to the insignificant relationship, this result cannot be concluded. This result is consistent with the previous studies such as Petria et al. (2015), who found that inflation doesn't affect bank profitability and it means that in the CEMAC banking system, the bank management couldn't forecast the future inflation.

5. CONCLUSION AND RECOMMENDATIONS

This paper investigated the determinants of bank profitability in CEMAC countries spanning the period 2005-2014. The results of regression analysis revealed that credit risk is one of the main factors explaining the variability of bank's profitability in CEMAC countries. Furthermore, the finding also revealed that the impact of overheads on bank's profitability in CEMAC countries is negative and statically significant. This shows that poor expenses management contributes to the low level of profitability in CEMAC countries banking industry. However, bank's size has a positive and statistically significant impact on bank's profitability. This result means that larger banks have economies of scale and lower variance of earnings which resulted in profitability. Yearly growth in deposits affects negatively bank profitability. This implies that the banks couldn't convert the increasing amount of deposit liabilities into significantly higher income earnings. In addition, capital adequacy has a negative impact on bank profitability. This implies that high capital leads to low profitability. Concerning the external factors, GDP per capital growth affect negatively bank's profitability. It indicates that during the period of economic growth, the bank deposit tends to increase, but the banks couldn't transform them into significant loans, thus leads to low profitability. The impact of inflation on bank's profitability is positive and non-significant. It means that the bank management in CEMAC countries didn't forecast the future inflation during the study period.

Finally, these empirical results provide the evidence that both bank internal and external factors affect the profitability of banks in CEMAC countries. Accordingly to the results, we suggested that banks should improve their expenses management, by passing a part of their increased operating costs to depositors and lenders (in terms of lower deposit rates and higher lending rates) and the remaining part of the cost to the profit. Additionally, more policies on credit risk management should be enhanced in order to improve the asset quality, thus reducing the non-bank performing assets. Banks also need to put in place mechanisms for granting credits to economic agents, especially medium and long - term credits, by targeting the most profitable areas and services, since credit is an important source of profits in the economy. The regulation about capital adequacy needs to be revised, in order to provide a more clear definition of capital components and more accurate and sensitive risk weights to assets and exposures. Lastly, bank managers need to be responsive to the risks associated with the changes in the macroeconomic factors such as GDP and inflation. This would suggest that the priority should be given to the policies which aim at stabilizing the inflation and GDP growth, and hence improve the financial intermediation.

Overall, it is important to acknowledge that every research has limitations. During this study we encountered some difficulties such as the lack of data, this prevented us from doing a long term analysis and using others determinants of banks profitability like interest rate, ownership structure, taxation and regulations, financial structure, legal and institutional indices.

REFERENCES

Akhtar, M., Ali, K., & Sadaqat, S. (2011). Factors Influencing the Profitability of Islamic Banks of Pakistan. International Research Journal of Finance and Economics, *66*(66), 1-8.

Almazari, A. A. (2013). Capital Adequacy , Cost Income Ratio and the Performance of Saudi Banks, *3*(4), 284-293.

Alper, D., & Anbar, A. (2011). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. *Business & Economics Research Journal*, *2*(2), 139-152.

Asli Demirguc-Kunt and Harry Huizinga. (2000). Financial Structure and Bank Profitability. *Structure*, (January), 1-24.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-Specific, Industry- Specific and Macroeconomic Determinants of Bank Profitability. *Journal of International Financial Markets, Institutions and Money, Elsevier*, *18*(2), 121-136. https://doi.org/10.1016/j.intfin.2006.07.001

Baltagi, B. H., & Kao, C. (2000). Nonstationary panels, cointegration in panels and dynamic panels: A survey. *Advances in Econometrics*, *15*, 7-51. https://doi.org/10.1016/S0731-9053(00)15002-9

Bashir, A. H. (2003). Determinants of Profitability in Islamic Banks : Some Evidence From the Middle East. *Islamic Economic Studies*, *11*(1), 32–57.

Berger, A. N., Herring, R. J., & Szego, G. P. (1995). The Role of Capital in Financial Institutions. *International Library of Critical Writings in Economics*, *133*, 3–40.

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking & Finance*, *13*(1), 65-79.

Brooks, C. (2008). *Introductory Econometrics for finance* (second edi).

Christopher, I., Bank, K., & Branch, I. (2013). DETERMINANTS OF BANKS' PROFITABILITY IN A DEVELOPING ECONOMY: EVIDENCE FROM NIGERIAN BANKING INDUSTRY. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(9), 155-181.

Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*, *21*(3), 307-327.

Frederick, N. K. (2014). Factors affecting performance of commercial banks in Uganda a case for domestic commercial banks. *Proceedings of 25th International Business Research Conference 13 - 14 January, 2014, Taj Hotel, Cape Town, South Africa, ISBN: 978-1-922069-42-9*, 1-19.

Gul, S., Irshad, F., & Zaman, K. (2011). Factors affecting bank profitability in Pakistan. *The Romanian Economic Journal*, (39), 61-87.

Gyamerah, I. A., & Amoah, B. (2015). Determinants of Bank Profitability in Ghana. *International Journal of Accounting and Financial Reporting*, *5*(1), 173-187. https://doi.org/10.5296/ijafr.v5i1.7368

Hoffmann, P. S. (2011). Determinants of the Profitability of the US Banking Industry *. *International Journal of Business and Social Science*, *2*(22), 255-269.

Jaber, J. J., & Al-khawaldeh, A. A. (2014). The Impact of Internal and External Factors on Commercial Bank Profitability in Jordan, *9*(4), 22-30.

Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of Money Credit and Banking*, *30*(3, 2), 596-613.

Lipunga, A. M. (2014). Determinants of Profitability of Listed Commercial Banks in Developing Countries : Evidence from Malawi, *5*(6), 41–49.

Mansouri and Afroukh. (2009). La Rentabilité des Banques et ses Determinants : Cas du Maroc Brahim Mansouri et Saïd Afroukh Working Paper 462, (February).

Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. *Journal of Banking and Finance*, *16*(6), 1173-1178.

Munyambonera, E. F. (2013). Determinants of Commercial Bank Profitability in Sub-Saharan Africa. *International Journal of Economics and Finance*, *5*(9), 134-148.

Naceur, S. (2003). The Determinants of the Tunisian Banking Industry Profitability: Panel Evidence. *Universite Libre de Tunis Working Papers*, 1-17. Retrieved from http://www.mafhoum.com/press6/174E11.pdf

Osuagwu1, E. S. (2014). Determinants of Bank Profitability in Nigeria. *International Journal of Economics and Finance*, *6*(12), 93-113.

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, *21*(2), 222-237. https://doi.org/10.1016/j.ribaf.2006.03.007

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of Banks' Profitability: Evidence from EU 27 Banking Systems. *Procedia Economics and Finance*, *20*, 518-524. https://doi.org/10.1016/S2212-5671(15)00104-5

Rajan & Zingales. (1998). Financial dependence and growth: further evidence. *Applied Economics Letters*, *16*(3), 325–330.

Sufian, F. (2009). Determinants of Bank Profitability in a Developing Economy : Empirical Evidence from the China Banking Sector. *Journal of Asia-Pacific Business*, *10*(4), 281–307.

TANIMOUNE, N. A. (2001). Notes d'information et Statistiques - N° 539 - Août/Septembre 2003 - Etudes et Recherche.

Tchalim, T. (2015). Regular Banking Capital and Banks Profitability in the West African Economics and Monetary Union (Waemu). *Indian Journal Of Applied Research*, (October), 649–652.