

The Determinants of Banks' Financial Performance: Evidence from Algeria

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Abstract

The current study aims to investigate the determinants of banks' financial performance using a sample of twelve Algerian commercial banks during the period: 2010-2015. Using pooled regression analysis, results reveal that the bank's size has a strong positive effect on its performance, measured by net income. Results show also that both the bank's specialization and size have negative impact on its performance, measured by net interest margin (NIM), which means that small banks in Algeria are more able to generate interest margin. Findings show also that capital ratio has a positive effect on both return on assets (ROA) and net income (NI) which means that large banks in Algeria generate more profit. Results show no significant effect of some specific variables (credit risk, liquidity risk, and administrative efficiency) and no significant effect of macro-economic variables (inflation and gross domestic products). Banks are recommended to expand into new markets and offer new products so as to get larger and capitalize on size advantage. Moreover, they should maintain a strong capital ratio to support their operations and absorb potential losses.

Keywords: Algerian Banks, Financial Performance, Determinants.

JEL Classification Codes: G21; G32; E44

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Introduction

Banking activity is one of the important pillars of the economies of countries due to its significant contribution to supporting investment projects. Therefore, it is necessary to pay attention to the financial performance of banks so that they can achieve the goals they strive for and contribute to the development and growth of the economy.

Studying the determinants of banks' performance is crucial in understanding the stability and efficiency of the financial system. Banks play a vital role in the economy by intermediating funds, providing credits, and facilitating economic growth. By analyzing the factors that influence banks' performance, researchers and policymakers can identify potential risks, improve regulatory frameworks and enhance the overall resilience of the banking sector. The performance of banks impacts not only the financial markets but also the broader economy, making it essential to develop into the key drivers of their success or failure.

Research Objectives

The present study aims to investigate the impact of a set of bank-specific variables on the financial performance of Algerian commercial banks like size, capital ratio, and liquidity. Moreover, the study aims also to examine the impact of macroeconomic variables, like inflation and GDP on banks' financial performance.

Research Problem

In order to achieve our purpose, the research problem can be formulated as follows:

What are the determinants of the financial performance of Algerian commercial banks?

From this research problem, the following sub-questions can be derived:

- ✓ What is the impact of liquidity risk on the financial performance of Algerian commercial banks?
- ✓ What is the relationship between growth opportunities and the financial performance of Algerian commercial banks?
- ✓ What is the relationship between bank size and its financial performance in Algeria?
- ✓ How does administrative efficiency affect the financial performance of Algerian commercial banks?
- ✓ How do macroeconomic variables, including inflation and GDP, affect the financial performance of Algerian commercial banks?

Research Hypotheses

Elissa. et al. (2018) and Mashamba T. and Chikutuma C. N. (2023) find that liquidity is a significant determinant of bank profitability. However, results of Mauricio (2014) and Bougtaf (2017) show that liquidity risk has a negative impact on bank performance. Being in line with Mauricio and Bougtaf, the following hypothesis is set:

H1: Liquidity risk negatively affects the performance of Algerian commercial banks.

The results of Mauricio (2014) and Bougtaf (2017) also indicate that the capital ratio has a significant positive impact on bank performance. Hence, the following hypothesis is formulated:

H2: Capital adequacy positively affects the performance of Algerian commercial banks.

According to Farouhi (2014), E.Menicucci (2016) and Mashamba and Chikutuma (2023), bank size has a significant impact on bank performance. Furthermore, results of Elissa et al (2018) show that bank size has a high significant impact on banks' profitability. Consequently, the following hypothesis is proposed:

H3: Bank size positively affects its performance.

Mauricio (2014) and E.Menicucci (2016) found that performance is negatively affected by the debt-to-equity ratio. Therefore, the following hypothesis is proposed:

H4: Debt risk negatively affects the performance of Algerian commercial banks.

Elissa et al (2018) show that operating efficiency has a significant effect on banks' profitability. In addition, Mashamba and Chikutuma (2023) find that cost efficiency has a negative impact on banks' profitability. While Mauricio's (2014) study concluded that administrative efficiency has a statistically significant impact on bank performance. Therefore, the following hypothesis is proposed:

H5: Bank performance is negatively affected by administrative efficiency.

Studies by James Aydele (2014) and Farouhi (2014) suggest that macroeconomic factors, including inflation, negatively impact bank performance. Hence, the following hypothesis is formulated:

H6: There is a negative relationship between the inflation rate and the financial performance of Algerian commercial banks.

The findings of Mauricio (2014) indicate that GDP growth rate has a positive impact on bank performance. Therefore, the following hypothesis is proposed:

H7: GDP growth rate positively affects the performance of Algerian commercial banks.

The remainder of this paper is organized into two sections. Section 1 describes the methodology employed in the current paper. Section 2 presents the results of the study. The conclusion summarizes the main results of the study and provides recommendations.

Firstly. **Research Methodology**

This section presents the sample employed in the study and the research model employed to test the study hypotheses.

1. Sample of the Study

The population of the study consists of all commercial banks operating in Algeria, which are 20 banks. As for the sample of the study, due to the unavailability of information of some banks, data was adopted to include 12 commercial banks.

To achieve the objectives of the study, the information obtained from the portal of the National Center for the Commercial Register is used. In addition, the statistical program for the multiple linear regression model was used in this study.

2. Regression Models

To test the determinants of the financial performance of Algerian commercial banks, the multiple regression model was adopted to study the impact of a set of independent variables (liquidity risk, borrowing risk, capital ratio, size, administrative efficiency, inflation rate, GDP growth rate) on the financial performance of Algerian commercial banks. Four measures of bank financial performance were adopted, resulting in four multiple regression models as follows:

Model 1: Dependent variable is ROA

$$\text{ROA} = \alpha + \beta_1 \text{LR} + \beta_2 \text{SL} + \beta_3 \text{CR} + \beta_4 \text{SIZE} + \beta_5 \text{CAP} + \beta_6 \text{AE} + \beta_7 \text{INF} + \beta_8 \text{GDP}$$

Model 2: Dependent variable: Return on equity (ROE)

$$\text{ROE} = \alpha + \beta_1 \text{LR} + \beta_2 \text{SL} + \beta_3 \text{CR} + \beta_4 \text{SIZE} + \beta_5 \text{CAP} + \beta_6 \text{AE} + \beta_7 \text{INF} + \beta_8 \text{GDP}$$

Model 3: Dependent variable: Net profit margin (NPM)

$$\text{NPM} = \alpha + \beta_1 \text{LR} + \beta_2 \text{SL} + \beta_3 \text{CR} + \beta_4 \text{SIZE} + \beta_5 \text{CAP} + \beta_6 \text{AE} + \beta_7 \text{INF} + \beta_8 \text{GDP}$$

Model 4: Dependent variable: Net Income (NI)

$$\text{NI} = \alpha + \beta_1 \text{LR} + \beta_2 \text{SL} + \beta_3 \text{CR} + \beta_4 \text{SIZE} + \beta_5 \text{CAP} + \beta_6 \text{AE} + \beta_7 \text{INF} + \beta_8 \text{GDP}$$

3. **Dependent Variables**

Return on Assets (ROA): The return on assets ratio measures the profitability of a bank by showing how much profit the bank is generating relative to its total assets.

Return on Equity (ROE): The return on equity ratio measures the profitability of a bank for its shareholders by showing how much profit the bank is generating relative to the amount of equity invested by shareholders.

Net Income Margin (NIM): The net interest margin ratio measures the profitability of a bank's lending activities by showing the difference between the interest income that the bank earns from its loans and the interest expense that the bank pays on its deposits.

Net Income (NI): The net income is the total profit of a bank after all expenses and taxes have been deducted. It is used as a measure of performance regardless of the size of the bank's assets or its financing method. For the purposes of normal distribution, the natural logarithm of net income is used as a measure of performance.

4. **Independent Variables**

Credit Risk (CR): Credit risk is the risk that a borrower will default on a loan.

Liquidity Risk (LR): Liquidity risk is the risk that a bank will not be able to meet its obligations to its depositors and other creditors.

Specialization (SL): Specialization is a measure of a bank's focus on a particular type of lending.

Bank Size (Size): Bank size is measured by the natural logarithm of total assets. This is done for purposes of normal distribution.

Capitalization (Cap): Capitalization is the ratio of a bank's equity to its total assets. It is a measure of a bank's financial strength.

Administrative Efficiency (AE): Administrative efficiency is a measure of a bank's ability to control its costs.

Inflation Rate: The inflation rate is the rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling.

GDP: The GDP growth rate is the rate at which the gross domestic product (GDP) of a country is increasing. GDP is a measure of the total value of all goods and services produced in a country in a given period of time.

Table (1): summary of variables

Variable	Abbreviation	Measurement
Dependent Variables		
Return on Assets	ROA	Net income / Total assets
Return on Equity	ROE	Net income / Shareholders' equity
Net Interest Margin	NIM	(Total interest income - Total interest expense) / Total assets
Net Income	NI	log(Income)
Independent variables		
Credit Risk	CR	Total provisions / Total loans
Liquidity Risk	LR	Liquid assets / Total loans
Specialization	SL	Total deposits / Total assets
Bank Size	Size	Total Equity / Total assets
Capital Ratio	Cap	Ln (Total Assets)
Administrative Efficiency	AE	Operational expenses / Total assets
Inflation Rate	Inf	Official statistics
GDP Growth Rate	GDP	Annual GDP growth rate

Secondly. Data Analysis and Discussion of Result

1. Descriptive Statistics

Table 2 presents a summary statistics for both the dependent and independent variables used in the models of the determinants of commercial banks' performance. The descriptive is carried out after the realization of the required modifications and changes (removal of outliers and log transformations). Thus the data set comply with the pooled multiple regression assumptions (normality, collinearity, autocorrelation, homoscedasticity).

Table(2) Descriptive Statistics

Variable	N	Min	Max	Mean	Std. Dev
ROA	37	0.0002	0.0658	0.0182	0.0138
ROE	16	0.0096	0.3127	0.1308	0.1062
NIM	37	0.0057	0.0702	0.0321	0.0182
(IN)	38	12.46	24.29	17.6355	4.1129
(CR)	38	0.000	0.0144	0.0031	0.0043
(LR)	38	0.0736	1.4149	0.5199	0.3301
(SL)	36	0.000	0.9254	0.2932	0.3772
(Size)	37	17.0131	28.6006	22.1238	4.0101
(Capital)	37	0.000	1.2011	0.0923	0.2243
(AE)	37	0.0094	0.0936	0.0429	0.0222
(Inf)	38	2.9000	7.7000	5.0368	1.7648
(GDP)	38	2.8000	3.9000	3.3316	0.4211

2. Discussion of Results

Before performing the pooled regression analysis, the data set comply with the pooled multiple regression assumptions (normality, collinearity, autocorrelation, homoscedasticity).

2. 1. Results of the ROA model

Results of the Pooled OLS Regression Analysis are shown in table 3

Table (3) : Analysis of Results for ROA Model

Variable	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
(Constant)	0.029	-	1.769	0.087
CR	-0.529	-0.166	-0.492	0.627
LR	0.001	0.029	0.168	0.867
SL	-0.01	-0.278	-1.145	0.261
Size	0	-0.082	-0.501	0.62
Cap	0.08	0.714	3.13	0.004
AE	-0.109	-0.175	-0.995	0.328
F=2.94, P=0.02 Adj R-Squared=0.37				

The ROA model is significant ($F=2.94$, $P=0.02$) with an R-squared of 0.37. This means that 37% of the variation in ROA is explained by the independent variables in the model.

The only independent variable that has a significant effect on ROA is Capital Ratio (Cap) ($t=3.13$, $P=0.004$). This means that a 1% increase in Cap is associated with a 0.08% increase in ROA. This suggests that capital ratio has a positive impact on bank profitability.

2.2 Results of the ROE Model

Results of the Pooled OLS Regression Analysis are shown in table 4.

Table (4): : Analysis of Results for ROE Model

Variable	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
(Constant)	0.211	-	0.537	0.606
CR	-9.936	-0.345	-0.79	0.452
LR	0.004	0.016	0.035	0.973
SL	-0.21	-0.431	-0.761	0.469
Size	0.009	0.326	0.928	0.38
Cap	-0.094	-0.144	-0.252	0.807
AE	-0.662	-0.151	-0.356	0.731
F= 0.394, P= 0.864 Adj R-square = 0.14				

According to table 4, the ROE model is not significant (F=0.394, P=0.864) with a very low R-squared of 0.14. This means that results of this model are not accepted; In other words, variation in ROE is not explained by variables of the model.

2.3 Results of the NIM Model

Table (5): : Analysis of Results for NIM Model

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
(Constant)	0,070		3,344	0,002
CR	0,508	0,125	0,364	0,719
LR	-0,006	-0,113	-0,647	0,523
SL	-0,027	-0,566	-2,300	0,029
Size	-0,001	-0,284	-1,703	0,099
Cap	0,035	0,241	1,042	0,306
AE	-0,030	-0,038	-0,213	0,833
F= 2.743 sig= 0.031 Adj R-square = 0.36				

Table 5 indicates that the NIM model is statistically significant ($F=2.74$, $p=0.03$) with a correlation coefficient of 0.36 (R^2). This implies that the model is acceptable and that 36% of the variations in net interest margin (NIM) are explained by the independent variables of the model.

The model shows that both bank size and growth opportunities have an impact on performance. Bank size has a statistically significant effect at the 5% level ($t=-2.30$; $p=0.029$), while growth opportunities have a statistically significant effect at the 10% level ($t= -1.7$, $p=0.099$). However, the effect of size is negative on financial performance as measured by NIM. This is because bank size has an impact on the level of bank performance. Banks may generate outstanding performance because they are more able to utilize economies of scale and have the ability to organize their activities efficiently. In this context, size has a negative impact on bank performance, as the growth of bank size may lead to an inability to maintain the bank's outstanding performance. This is consistent with the findings of Antonio Trujillo-Ponce (2011), who showed that the smaller the bank size, the higher its profitability and the more outstanding its performance, and it contradicts the findings of James Ayodele (2014) and Bougtaf (2017).

The impact of growth opportunities on financial performance is also negative, as the loss of investment opportunities and sectoral growth negatively impacts bank performance. This is consistent with the study by James Ayodele (2014) and contradicts the findings of Mauricio (2014).

Therefore, based on the NIM model, there is a negative relationship between performance and bank size (SIZE) on the one hand and growth opportunities (SL) on the other hand. Consequently, the third hypothesis

regarding the positive relationship between bank performance and size was not confirmed, as the model results showed the opposite, i.e., that bank size has a negative impact on bank performance and the relationship between growth opportunities and bank performance is negative, while the rest of the hypotheses may have been rejected.

2.4 Results of the Net Income Model

Results of the Pooled OLS Regression Analysis are shown below in table 6.

Table (6): Analysis of Results of the NI Model

Variable	Unstandardize d Coef	Standardize d Coef	t	Sig.
(Constant)	-4,275		-2,565	0,016
CR	-131,942	-0,152	-1,189	0,244
LR	0,732	0,063	0,973	0,339
SL	-0,920	-0,091	-0,991	0,330
Size	0,966	0,989	15,925	0,000
Cap	6,786	0,222	2,575	0,015
AE	5,178	0,030	0,457	0,651
F= 49.646, P= 0.000 Adj- R-square = 0.892				

According to table 6, the NI model is significant (F=49.64, P=0.000) with an R-squared of 0.91. This means that 91% of the variation in net income is explained by the independent variables in the model.

The results of the study suggest that the following factors have a positive impact on bank profitability, as measured by net income:

Capital ratio (t=2.575, P=0.015): This means that a 1% increase in Capital ratio is associated with a 6.786% increase in NI. This suggests that banks with higher capital ratios have higher net income. This finding is

consistent with the results of the ROA model and the studies by Mouricio (2014), Bouguettaf (2017), and Menicucci (2016).

Size ($t=15.925$, $P=0.000$): This means that a 1% increase in Size is associated with a 0.966% increase in NI. This suggests that larger banks have higher net income. This finding is consistent with the study by Farouhi (2014) and (2016). It contradicts the finding from the NIM model, which showed a negative impact of size on profitability. However, the NI model has a stronger R-squared (0.91) than the NIM model (0.36), suggesting that the NI model provides a more reliable estimate of the relationship between size and profitability.

Conclusion

The main purpose of this study is to investigate factors that may affect the financial performance of commercial banks in developing countries namely in Algeria. In order to achieve this purpose, data of a sample of 12 commercial banks in Algeria during the period 2010-2015 were used to examine the determinants of financial performance. Finding of pooled regression analysis identified that capital ratio and bank size are positively and significantly related to financial performance. However, growth opportunities seems to be negatively and significantly related to financial performance. Results show no significant effect of other independent variables on firm performance including credit risk, liquidity risk and administrative efficiency.

Recommendations

According to the research findings, banks are recommended to:

- ✓ Expand into new markets and offer new products to move for larger banks and capitalize on their size advantage.
- ✓ Ensure that they maintain a strong capital ratio to support their operations and absorb potential losses. Regularly assess capital needs and adjust capital allocation strategies accordingly.
- ✓ Implement regular monitoring and analysis of performance metrics related to the specialized activity to identify trends, issues, and opportunities for improvement in net income margin.

References

1. Bougatef, K. (2017). *Determinants of bank profitability in Tunisia: does corruption matter?* Journal of Money Laundering Control, Vol. 20 Iss 1 pp. 70 – 78.
2. Chikutuma, T. M. (2023). Determinants of Bank profitability: Evidence from the Emerging Economy. *Corporate and business strategy review*, 4(4).
3. Elissa A. Al-Homaidi, M. I. (2018). Bank-specific and macro economic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics and Finance*, 6(1).
4. Ferrouhi, E. M. (2014). *Bank liquidity and financial performance: evidence from morocco an banking industry*. avenue des nations-unies, b.p. 721 agdal, rabat, morocco: faculty of law and economics, mohammed bagdal university.
5. Gunter Capelle-Blancard, T. C. (2004). *L'apport des modèles quantitatifs à la supervision bancaire en Europe*. france: Revue française d'économie, Vol 19, N° :1; p : 78.
6. Makhamreh, M. (2000). Corporate performance in Jordan: a study of banking sector. *the Arab Bank Review*, 2(2), pp. 40–48.
7. Norton, K. a. (1992). *The Balanced Scorecard measures that drive performance*. Harvard business review, p 72.

8. Owoputi, J. A. (september 2014). Macroeconomic determinants of bank profitability in nigeria. *European scientific Journal*, 10.
9. Paolucci, E. M. (2016). *The determinants of bank profitability: empirical evidence from European banking sector* . EmeraldInsight: Journal of Financial Reporting and Accounting : Vol. 14 Iss 1 pp. 86 -115.
10. Perales, M. J.-B. (2014). Determinants of bank performance: evidence for Latin America . *Academia Revista Latinoamericana de Administración*, Vol. 27, Iss 2 pp. 164 – 182.
11. September, E. S. (2014). Macroeconomic determinants of bank profitability in Nigeria. edition vol.10, No.25, ISSN: 1857 – 7881 (Print) e - ISSN 1857-7431.
12. Trujillo-Ponce, A. (2011). *Why are (or were) Spanish banks so profitable?* Seville, Spain: Department of Business Administration, Pablo de Olavide University, Carretera of Utrera Km 1.