

Empirical Analysis of the Determinants of Banking Profitability: Application to a Panel of Algerian Banks

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Abstract:

This study examines the determinants of profitability for Algerian commercial banks over the period 2014-2022 using panel data analysis. Results show that ownership structure strongly influences profitability, with private banks outperforming public ones. Economic growth and inflation also have positive effects, while internal factors like liquidity and capitalization are not significant. These findings highlight the dominant role of institutional and macroeconomic factors over internal bank characteristics. The study suggests that improving governance and aligning banking strategies with economic conditions are essential for enhancing bank performance in Algeria.

Keywords: banking performance, Banking profitability, Algerian banking sector, Panel data analysis

Jel Classification Codes : G21 ; G32 ; E44 ; C23

1. INTRODUCTION

In emerging economies with high financial intermediation, banks play a vital role in mobilizing savings, funding investment, and managing liquidity (Levine, 2005; Demirgüç-Kunt & Huizinga, 1999). In Algeria, where the banking sector is the primary source of economic financing, profitability, often measured by return on assets (ROA), is strategically important, especially amid ongoing structural reforms and limited financing diversification (Bougherara & Benbouziane, 2020). ROA serves as a key indicator of bank performance, financial health, and managerial efficiency (Athanasoglou, Brissimis & Delis, 2008).

Bank profitability is influenced by institutional factors (e.g., ownership structure), structural elements (e.g., liquidity, capitalization, credit structure), and macroeconomic variables such as inflation and economic growth. Although extensively studied internationally (Flamini, McDonald & Schumacher, 2009; Dietrich & Wanzenried, 2011), findings in the Algerian context remain fragmented, outdated, and sometimes contradictory. Given the dominance of public banks, limited competition, and macroeconomic volatility, the following research question arises: **To what extent do institutional, structural, and macroeconomic factors influence the profitability of commercial banks in Algeria, as measured by ROA?**

This study formulates three hypotheses:

- H1: Privately-owned banks are more profitable than publicly-owned ones.
- H2: Economic growth positively affects bank profitability.
- H3: Inflation has a positive impact on profitability in the Algerian context.

To test these hypotheses, an econometric panel data model is applied to a sample of 20 commercial banks over the 2014–2022 period. The model incorporates variables reflecting ownership (institutional), capitalization, liquidity, and credit structure (structural), and inflation and GDP growth (macroeconomic). Robustness is ensured through diagnostic checks for

heteroscedasticity and autocorrelation, and specification tests (Fisher and Hausman) guide the model selection.

The article is structured as follows: a literature review, methodology and model presentation, empirical results, and finally, discussion and policy recommendations.

2. Review of Literature

Banking profitability remains a central theme in financial research, shaped by both internal (bank-specific) and external (macroeconomic) factors. Internally, variables such as size, capital adequacy, liquidity, efficiency, and risk management are key. Externally, GDP growth, inflation, interest rates, and regulatory environments also exert significant influence.

Bourke (1989) emphasized the joint role of market structure and macroeconomic conditions. Demirgüç-Kunt and Huizinga (1999) developed a broader model integrating both internal and external variables. In Europe, Goddard, Molyneux, and Wilson (2004) introduced a dynamic approach incorporating bank size, past performance, and the business cycle. Athanasoglou, Delis, and Staikouras (2006) confirmed these findings in South-Eastern Europe, as did Flamini, McDonald, and Schumacher (2009) in sub-Saharan Africa, highlighting capital adequacy, efficiency, and risk as key drivers of profitability.

Regional studies offer mixed but insightful results. In Saudi Arabia, Srairi (2010) identified positive effects from size, liquidity, and capitalization, while asset quality and costs had variable impacts. In Côte d'Ivoire, Assienin and Ouattara (2020) highlighted capitalization, liquidity, and efficiency as performance drivers. Dembélé and Machrafi (2021) added profit margin and market share to the list of relevant variables. In the MENA region, Elouali and Oubdi (2020), focusing on Islamic banks, found that while size and liquidity enhance profitability, asset quality, capitalization, and efficiency may reduce it, suggesting specificities tied to Islamic banking models.

In Algeria, empirical findings are more fragmented. Briki (2017) linked public banks' weak performance to inefficiencies and poor governance. Benilles (2018), using data from twenty banks, found positive effects from liquidity and income diversification, while financial leverage

had a negative impact. Size and loan quality were statistically insignificant. Boudiaf, Chamakhi, and Boukhalfa (2018) identified the exchange rate as the only significant factor affecting ROE, with no substantial impact from capital adequacy or liquidity.

Overall, literature suggests that internal factors—especially capitalization, liquidity, and efficiency—are consistent predictors of bank profitability, whereas macroeconomic influences vary by context. Algerian studies often diverge from broader trends, possibly due to governance issues, data limitations, or methodological constraints. This study contributes by re-examining these determinants using updated data and a more rigorous econometric approach tailored to the Algerian banking sector.

3. Determinants of banking performance

Banking performance is shaped by both internal and external factors, which affect profitability, stability, and efficiency. Understanding these determinants is essential to evaluate the resilience and competitiveness of financial institutions.

3.1. Internal Determinants of Banking Performance

Internal determinants reflect each bank's unique characteristics, mostly tied to managerial and operational factors (Benilles, 2018). These are derived from financial statements and reflect organizational, strategic, or microeconomic dimensions.

3.1.1 Bank Size

Larger banks often benefit from economies of scale and better risk management (Elouali & Oubdi, 2020), but excessive size can reduce flexibility and efficiency (Achibane & Chakir, 2019). Thus, the effect of size on performance remains context-dependent.

3.1.2 Capital Adequacy

Capital adequacy, reinforced under Basel II, enhances loss absorption capacity and financial stability (Menchif, Chemlal & Saikak, 2018; Srairi,

2010). A low ratio exposes banks to higher risks (Dembélé & Machrafi, 2021).

3.1.3 Capitalization

Measured by equity-to-assets ratio, capitalization strengthens solvency, reduces risk, and boosts lending capacity (El Bahbouhi & Touab, 2023; Niyuhire & Mureha, 2024).

3.1.4 Credit Structure

A balanced loan-to-deposit ratio supports profitability, but excess lending over deposits may create liquidity strains (El Bahbouhi & Touab, 2023; Chayoua & Moussaten, 2022).

3.1.5 Credit Risk

High non-performing loan (NPL) ratios reduce profits due to provisioning needs. Proper loan quality management is essential for stability (Achibane & Chakir, 2019).

3.1.6 Bank Liquidity

Liquidity ensures short-term obligations are met. While essential for solvency, excessive idle liquidity can reduce returns (Dembélé & Machrafi, 2021; Srairi, 2010).

3.1.7 Asset Quality

Asset deterioration weakens earnings and liquidity. Prudent and diversified asset management enhances stability (Menchif, Chemlal & Saikak, 2018).

3.1.8 Operational Efficiency

Efficiency improves profitability by minimizing costs and operational risks (Srairi, 2010). It supports innovation and long-term competitiveness.

3.1.9 Market Share

Higher market share may lead to performance gains through scale and efficiency (Dembélé & Machrafi, 2021), but poor management of rapid growth can offset these benefits.

3.1.10 Sensitivity to Market Risk

Dependence on market variables (rates, exchange rates, asset prices) increases vulnerability. Risk can be mitigated via diversification and hedging (Menchif, Chemlal & Saikak, 2018).

3.2. External Determinants of Banking Performance

External factors, beyond banks' direct control, also shape performance. These include macroeconomic, technological, and regulatory variables.

3.2.1 Economic Growth

Economic expansion stimulates credit demand and revenue but can also bring risks if unstable. Bank performance depends on how well these risks are managed (Gahungu & Muhamari, 2012).

3.2.2 Inflation

Moderate inflation may increase interest margins, while high inflation erodes profitability. Effective rate adjustments are key (Dembélé & Machrafi, 2021; Gahungu & Muhamari, 2012).

3.2.3 Lending Rates

Lending rates directly affect income. Excessive rates may reduce demand and increase defaults (Niyuhire & Mureha, 2024). Managing interest rate risk is vital (Srairi, 2010).

3.2.4 Ownership Structure

Private and foreign banks tend to be more profitable due to better management practices and financial discipline (Benilles, 2018; Chayoua & Moussaten, 2022).

3.2.5 Technology and Innovation

Digital transformation improves performance by enhancing services and reducing costs, despite challenges like cybersecurity (Sadouki & Bouchikhi, 2022).

3.2.6 Management and Governance

Strong governance—board independence, equity requirements, and meeting frequency—supports performance and stability (Talhaoui & Azzaoui, 2023).

3.2.7 Regulatory Environment

While a strict regulatory framework (e.g., Basel II) improves system soundness, it may limit profitability by encouraging low-risk, low-return assets. Balance is essential (Pasiouras et al., 2009).

4. Empirical framework: specification of the model and choice of variables

This section presents the empirical framework adopted for the analysis of the determinants of bank profitability in the case of a panel of Algerian banks. We begin by specifying the econometric model chosen, before defining the variables used in the estimation.

4.1 Choice and justification of the model

This study analyzes bank financial performance using the return on assets (ROA) as the dependent variable, based on a panel of 180 observations from 20 banks over nine years. Given the structure of the dataset—multiple entities (N) observed across time periods (T)—a panel data model is appropriate, as it accounts for both cross-sectional and time-series heterogeneity (Talem & Boulabbas, 2023). This approach allows for robust estimation of the impact of various explanatory variables on bank profitability.

4.2. Specification of the model

The empirical model used is based on the work of Athanasoglou et al (2006) and Demirgüç-Kunt and Huizinga (1999), taking account of internal variables specific to each bank and, where appropriate, macroeconomic factors. The form of the model is as follows: $ROA_{it} = a_0 + a_1LD_{it} + a_2LQD_{it} + a_3CAP_{it} + a_4PROP_{it} + a_5INF_{it} + a_6GE_{it} + \varepsilon_{it}$

5. Presentation of the variables in the model

This section presents the variables used in our empirical study, distinguishing the dependent variable from the independent variables, in line with our analytical objectives (See appendix 1).

5.1 Dependent variable

The return on assets (ROA) is chosen as the primary indicator of Algerian banks' financial performance. Widely used in the literature, ROA measures a bank's ability to generate profit from its total assets, regardless of financing structure. Previous studies such as Benilles (2018), Niyuhire and Mureha (2024), and Elouali and Oubdi (2020) have also adopted ROA as the dependent variable for bank profitability.

5.2 Explanatory variables

Based on the literature, determinants of banking performance are classified into internal (microeconomic) factors related to each bank's characteristics, and external (macroeconomic) factors linked to the broader economic environment. This study selects seven explanatory variables: five internal variables derived from banks' financial statements and two external macroeconomic variables. The choice relies on prior research emphasizing the most relevant and frequently used determinants of profitability.

6. Data and methodology

This study covers nearly all Algerian banks, with a database of 180 observations from 20 banks over the period 2014–2022. Data were mainly collected from official financial statements (balance sheets and income statements) sourced from the Centre National du Registre du Commerce (CNRC) and banks' official websites when available. Data reliability was ensured through cross-verification from multiple sources. The compiled data

served to calculate financial ratios used as explanatory variables and the dependent variable, processed with Excel 2019.

7. Results and discussion

Given the space constraints, only the main assumptions and the model specification are briefly outlined below.

In what follows, we present the research hypotheses formulated on the basis of the theoretical framework, as well as the specification of the econometric model chosen to analyze the financial performance of Algerian banks.

7.1 Presentation of Hypotheses:

Six hypotheses were put forward concerning the expected effects of the explanatory variables on bank profitability (measured by ROA):

- **Credit structure:** expected positive effect on financial performance.
- **Bank liquidity:** expected positive effect due to ability to meet short-term commitments.
- **Capitalization:** positive effect expected as a lever for financial stability.
- **Type of bank ownership (public or private):** significant relationship expected.
- **Inflation:** expected negative impact on bank profitability.
- **Economic growth:** positive effect expected, reflecting a favorable environment.

7.2. Fisher test

Table 1. Fisher test results

Fisher Test Result	F-Statistic (Fisher)	Degrees of Freedom 1 (Df1)	Degrees of Freedom 2 (Df2)	P-value

Test Value	3.0725	18	155	8.526e-05
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Source: Results produced using R 4.5.0 software

The Fisher specification test (Table 1) was used to compare the fixed effects model with the Pooling model. The F statistic obtained ($F = 3.0725$; $p\text{-value} = 8.53e-05$) is significant at the 1% level, leading to the rejection of the null hypothesis of homogeneity of individual effects. This result indicates that specific differences between banks cannot be ignored in the analysis. Consequently, the use of a fixed-effects model is statistically justified, as it better captures the unobserved heterogeneity between the sample units.

7.3. Hausman test

Table 2. Hausman test results

Hausman Test Result	Chi-Square Statistic (χ^2)	Degrees of Freedom	p-value
Test Value	0.36681	5	0.9962

Source: Results produced using R 4.5.0 software

The p-value of 0.9962 is very high, well above the 5% threshold. This means that we cannot reject the null hypothesis of the test, which states that there is no significant difference between the estimators of the two models. We therefore conclude that the random effects model is more appropriate for our data, as it is more efficient and its estimators are convergent under this hypothesis.

7.4. Application of model diagnostic tests

7.4.1. Application of the heteroscedasticity test

Table 3. Heteroskedasticity test results

Breusch-Pagan Test Result	Breusch-Pagan Test Statistic	Degrees of Freedom (df)	P-value
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Test Value	26.792	6	0.0001584
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Source: Results produced using R 4.5.0 software

The Breusch-Pagan test (Table 3) was used to assess the hypothesis of homoscedasticity of errors. The results ($\chi^2 = 26.792$; $df = 6$; $p\text{-value} = 0.0001584$) indicate a significant violation of this hypothesis at the 5% threshold. The null hypothesis of homoscedasticity is therefore rejected, suggesting the presence of heteroscedasticity in the model. This instability in the error variance implies that the standard estimators could be biased. Consequently, it is necessary to adopt estimates that are robust to heteroscedastic errors in order to guarantee the reliability of inferences.

7.4.2. Application of the autocorrelation test

Table 4. Autocorrelation test results

Wooldridge test results	Chisq	Df	P-value
Test Value	45.772	9	6.638e-07

Source: Results produced using R 4.5.0 software

The Wooldridge test applied to the panel data (Table 4) reveals significant autocorrelation of the errors in the fixed-effects model ($\chi^2 = 45.772$; $df = 9$; $p\text{-value} = 6.64e-07$). As the $p\text{-value}$ is well below the 5% threshold, the null hypothesis of no autocorrelation is rejected. This result indicates a violation of the independence of the residuals, likely to bias the estimates and compromise the effectiveness of the coefficients. To ensure the validity of the inferences, it is necessary to correct for this autocorrelation using suitable robust estimators.

7.5. Estimation of the model before corrections

A preliminary estimate of the model was made before correcting for autocorrelation and heteroscedasticity problems, the presence of which was demonstrated in an earlier stage of the analysis. This estimate is presented

only for comparison with the results obtained after correction, without any detailed interpretation of its results.

Table 5. Random-effects model results before corrections

Variable	Estimate	Std. Error	z-value	Pr(> z)
(Intercept)	0.002085	0.008412	0.247829	0.80426
LD	-0.00695	0.008002	-0.86802	0.385383
LQD	0.007861	0.005346	1.470555	0.141411
CAP	0.011534	0.00914	1.262	0.206949
PROP	0.011291	0.002897	3.897004	9.74E-05 ***
INF	0.052329	0.038656	1.353682	0.175838
GE	0.174523	0.06785	2.57187	0.010115 *

Source: Results produced using R 4.5.0 software

*** : significant at $p < 0.001$; * : significant at $p < 0.05$

It can be seen that the PROP variable is highly significant at the 1% threshold, followed by the GE variable which is significant at the 1% threshold. On the other hand, the other variables (LD, LQD, CAP, INF) do not show statistical significance at the conventional thresholds, indicating a statistically unproven effect at this stage, before applying the necessary corrections.

7.6. Handling model specification problems

7.6.1. Heteroscedasticity correction

To correct the heteroscedasticity identified in our panel data model, we applied the `vcovHC` function from the `plm` library in R software. This correction adjusts the standard errors to make the model results more reliable.

Table 6. Heteroskedasticity correction results

Variable	Estimate	Std. Error	t value	Pr(> t)
Intercept	0.0020848	0.0071295	0.2924	0.77032
LD	-0.0069455	0.0058020	-1.1971	0.23290
LQD	0.0078613	0.0072643	1.0822	0.28067
CAP	0.0115341	0.0078529	1.4688	0.14371
PROP	0.0112908	0.0022799	4.9522	1.734e-06 ***
INF	0.0523285	0.0260198	2.0111	0.04587 *
GE	0.1745226	0.0940267	1.8561	0.06514 **

Source: Results produced using R 4.5.0 software

*** : significant at $p < 0.001$; * : significant at $p < 0.05$; **: significant at $p < 0.1$

The corrected results illustrated in the table (Tab 6) show that the PROP variable remains highly significant at the same threshold, while INF becomes significant at the 5% and GE 10% thresholds. No improvement was observed for the other variables.

7.6.2. Autocorrelation correction

For autocorrelation, we used the `vcovSCC` function, also available in the `plm` library. This correction makes it possible to deal simultaneously with autocorrelation and heteroscedasticity in panel data, ensuring the robustness of the econometric results.

The table below (Tab 7) presents the results of the random effects model after correction for autocorrelation. It can be seen that, following this correction, only the PROP and GE variables retain significance at the 5%

threshold. The significance of INF observed after correction for heteroscedasticity is no longer confirmed here.

Table 7. Results of the autocorrelation test correction

Variable	Estimate	Std. Error	t value	Pr(> t)
Intercept	0.0020848	0.0037504	0.5559	0.57900
LD	-0.0069455	0.0045004	-1.5433	0.12458
LQD	0.0078613	0.0073280	1.0728	0.28486
CAP	0.0115341	0.0078910	1.4617	0.14564
PROP	0.0112908	0.0048480	2.3290	0.02102 *
INF	0.0523285	0.0420126	1.2455	0.21462
GE	0.1745226	0.0879575	1.9842	0.04882 *

Source: Results produced using R 4.5.0 software, *: significant at $p < 0.05$

7.7. Re-estimation of the model after corrections

Table 8. Results of the random effects model after corrections

Variable	Estimate	Std. Error	t value	Pr(> t)
Intercept	0.0020848	0.0069895	0.2983	0.76585
LD	-0.0069455	0.0056880	-1.2211	0.22372
LQD	0.0078613	0.0071216	1.1039	0.27118
CAP	0.0115341	0.0076987	1.4982	0.13591
PROP	0.0112908	0.0022352	5.0514	1.106e-06 ***
INF	0.0523285	0.0255088	2.0514	0.04174 *
GE	0.1745226	0.0921803	1.8933	0.05999**

Source: Results produced using R 4.5.0 software

*** : significant at $p < 0.001$; * : significant at $p < 0.05$, ** significant at $p < 0.1$

These results suggest that, despite the corrections applied, only certain variables retain a statistically robust influence on the performance measured.

8. Results discussion

8.1. Credit structure

The estimated coefficient of -0.0069 for the loan-to-deposit (LD) ratio is negative and statistically insignificant ($p = 0.22372$), contrary to theoretical expectations that a high LD ratio reflects efficient intermediation. This suggests that, in some cases, high deposit mobilization may harm profitability due to excessive risk-taking, unbalanced loan growth, or liquidity pressures. In Algerian public banks, these issues may be worsened by structural and organizational weaknesses. The findings challenge the assumption of a positive LD ratio effect and emphasize the need for strict risk management and controlled credit policies to ensure profitability.

8.2. Bank liquidity

The econometric analysis of the liquidity variable (LQD) shows a positive but statistically insignificant coefficient (0.00786, $p = 0.27118$). While the positive sign aligns with theory—where adequate liquidity supports stability and confidence—the lack of significance indicates liquidity is not a decisive factor for Algerian banks' profitability (ROA). This finding echoes studies by Niyuhire and Mureha (2024) and Bediaf, Chemakhi, and Bekhaled (2018), suggesting that passive liquidity management or limited investment opportunities may explain the weak link. Excessive liquidity could also signal resource underutilization. Overall, the results partly support the hypothesis of a positive liquidity-performance relationship but lack strong empirical confirmation.

8.3. Capitalization

The econometric analysis of the CAP variable, representing bank capitalization, yields a positive coefficient (0.0115) that is statistically

insignificant ($p = 0.13591$). While the sign aligns with theoretical expectations—where higher capitalization should enhance profitability—the results do not show a significant impact on ROA. In theory, greater capitalization supports financial stability, loss absorption, and depositor confidence. However, consistent with findings by Niyuhire and Mureha (2024) and Bediaf, Chemakhi, and Bekhaled (2018), this advantage appears to have no measurable effect on Algerian banks' profitability. A possible explanation is the inefficient use of excess capital, reflecting overly conservative strategies that limit returns. Therefore, although capitalization is vital from a prudential standpoint, it does not emerge as a direct driver of performance in this context.

8.4. Bank Ownership

The econometric analysis indicates that private ownership (PROP) has a positive and highly significant effect on bank profitability, with a coefficient of 0.0113 and a p-value of 1.106×10^{-6} . This result underscores the crucial role of private capital in enhancing the performance of Algerian banks. Economically, private ownership is often linked to better governance, performance-driven management, and higher operational efficiency. Private banks tend to benefit from greater autonomy, stronger competitive pressure, and a profit-oriented culture. These findings align with Benilles (2018), who also found a significant positive relationship between private ownership and ROA. The evidence suggests that even partial privatization could be a strategic tool for improving banking sector efficiency. Hence, the theoretical hypothesis is fully validated.

8.5. Inflation

The inflation variable (INF) shows a positive and statistically significant impact on bank profitability, with a coefficient of 0.0523 and a p-value of 0.0417. Significant at the 5% level, this result implies that inflation has positively influenced bank performance in Algeria. While this contradicts the initial theoretical expectation, that inflation harms profitability by increasing costs and reducing real asset values, the finding may be explained by banks' ability to adjust interest rates, thereby protecting intermediation margins. Furthermore, moderate and predictable inflation during the study period may have been incorporated into strategic planning. In credit-driven income models, inflation may even boost profits in the short term. Thus, although the

sign contradicts theory, it remains economically plausible in this context, leading to the rejection of the initial hypothesis.

8.6. Economic Growth

The analysis of the economic growth variable, represented by the loan-to-deposit ratio (LD), produces a negative and statistically insignificant coefficient of -0.0069 ($p = 0.22372$). While no statistically significant relationship is observed, the negative sign challenges the theoretical expectation of a positive link.

In theory, a higher LD ratio reflects effective intermediation. However, in practice, especially in Algeria, excessive deposit mobilization may indicate higher risk exposure, poor management, or liquidity issues, particularly in public banks facing structural inefficiencies. These findings lead to the rejection of the hypothesis that economic growth (via intermediation efficiency) positively affects ROA.

9. CONCLUSION

The aim of this study was to identify and analyze the main determinants of the financial profitability of commercial banks in Algeria, measured by return on assets (ROA). Using an econometric panel data model covering a sample of twenty banks over the period 2014-2022, the work examined the joint influence of institutional, structural and macroeconomic factors on banking performance.

The empirical results obtained, after correcting for possible biases linked to heteroscedasticity and autocorrelation, partially confirm the hypotheses announced at the outset. On the one hand, ownership structure appears to be a determining factor: private banks prove to be significantly more profitable than their public counterparts, which fully validates hypothesis H1. This performance can be explained by more rigorous governance, a better allocation of resources and a managerial culture more focused on profitability.

On the other hand, the results show that economic growth exerts a positive and significant effect on ROA, albeit a moderate one, partially confirming hypothesis H2. Similarly, inflation has a positive effect on bank profitability, validating hypothesis H3, despite the fact that this link runs counter to conventional theoretical predictions. This singularity can be attributed to the ability of Algerian banks to quickly adjust their interest

rates or maintain their margins in a context of moderate, controlled inflation.

In contrast, internal structural factors such as liquidity, capitalization and credit structure showed no statistically significant effect on profitability. Although these variables are traditionally considered as determinants in the literature, their impact seems limited in the current Algerian context, perhaps due to institutional specificities, operational constraints or still inefficient management in some banks, particularly public ones.

The results of this study show that the performance of Algerian banks depends more on the institutional and macroeconomic environment than on their internal financial characteristics. This conclusion invites decision-makers to rethink the levers for improving bank profitability: these include promoting private or hybrid governance, increasing managerial autonomy in public banks, and strengthening strategic adaptation to macroeconomic dynamics.

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11. Appendices

Appendix 1. Summary of Model Determinants

	Explanatory Variable	Ratio Used	Calculation Method	
	Credit Structure	LD	Total Credits / Total Deposits	
	Bank Liquidity	LQD	Liquid Assets / Total Assets	
	Capitalization	CAP	Equity Capital / Total Assets	
	Bank Ownership	Prop	0: Public bank 1: Private bank	
	Inflation	INF	$[CPI(\text{year } N) - CPI(\text{year } N-1)] / CPI(\text{year } N-1)$	
	Economic Growth	GE (Growth of Economy)	$[GDP(\text{year } N) - GDP(\text{year } N-1)] / GDP(\text{year } N-1)$	

Source: Author’s elaboration