

Unraveling the impact of institutional governance quality on non-performing loans in the CEMAC region



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ABSTRACT

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This study examines how the quality of institutional governance, specifically the control of corruption and the rule of law, influences non-performing loans (NPLs) in the CEMAC region. Using a secondary panel data set of the CEMAC countries from 2002 to 2022, the study employs panel data analysis and estimation techniques, including Panel Corrected Standard Error (PCSE), the Feasible Generalized Least Squares (FGLS), and the Driscoll-Kraay Standard Errors (DKSE), to overcome the challenge of cross-sectional dependence that exists in the panel data. The results reveal that the control of corruption has a highly significant negative impact on NPLs, meaning that improved control of corruption leads to a decrease in NPLs. In contrast, the rule of law does not exhibit a direct significant effect on non-performing loans, suggesting that while the rule of law remains an essential component of strong institutional governance, its direct influence on NPLs may not be as pronounced as that of corruption control. Based on these findings, the authors recommend that policymakers at the regional level within CEMAC should focus their efforts on implementing deep anti-corruption measures and fostering a culture of transparency and accountability to effectively curb the rise in non-performing loans.

Contribution/ Originality: This study is among the first to examine how the quality of institutional governance, as captured by the control of corruption and the rule of law, influences non-performing loans (NPLs) in the CEMAC region. Additionally, it employs robust econometric techniques that consider cross-sectional dependence.

1. INTRODUCTION

The banking sector plays a crucial role in economic growth by facilitating financial intermediation, encouraging savings, and providing credit to various sectors of the economy. However, non-performing loans (NPLs) pose a serious threat to financial stability and economic progress, significantly impacting the performance and resilience of banks. NPLs, defined as loans that are in default or on the verge of default, serve as a key indicator of the overall health of the banking sector (International Monetary Fund (IMF), 2019).

The concept of non-performing loans has been integral to banking since the emergence of credit markets. In earlier times, loans were simply classified as either good or bad, without clear distinctions. However, as banking systems evolved, the need for well-defined classifications and effective NPL management became essential.

The Great Depression of the 1930s marked a pivotal moment in the history of non-performing loans (NPLs), with unprecedented loan defaults leading to widespread bank failures. This crisis highlighted the importance of strong credit risk management and the need to closely monitor loan performance. In response, regulatory bodies introduced

stricter measures, requiring banks to maintain higher reserves to cover potential loan losses (Mitchener & Richardson, 2013).

Post-World War II witnessed rapid economic growth and an increase in lending activities, which were subsequently followed by economic downturns, leading to fluctuations in the levels of non-performing loans. The 1970s and 1980s were particularly volatile due to oil crises, stagflation, and shifts in monetary policy. These factors triggered economic instability and surging NPL levels, as borrowers struggled with rising interest rates and financial uncertainty (Caprio & Klingebiel, 1996).

Another surge in non-performing loans occurred in the late 1990s during the Asian Financial Crisis, which severely impacted banking systems in countries such as Thailand, Indonesia, and South Korea. This crisis highlighted the interconnectedness of global financial markets and underscored the critical need for sound banking practices and effective regulatory oversight (Corsetti, Pesenti, & Roubini, 1999).

The 2008 global financial crisis, triggered by the collapse of the U.S. housing market, marked a pivotal moment in the understanding of non-performing loans (NPLs). In response, significant regulatory reforms were introduced to strengthen the resilience of the banking sector. These included measures such as the Basel III framework, which sought to enhance capital requirements, reinforce central bank authority, and promote greater financial stability by reducing systemic risks and enforcing stricter financial regulations (Bagehot, 1873; Black, 2009; Issing, 2008).

More recently, the COVID-19 pandemic introduced new challenges, as economic disruptions placed financial strain on borrowers. In response, governments and central banks around the world implemented unprecedented fiscal and monetary policies to support businesses and households. However, concerns about a potential rise in NPLs persisted, as the long-term economic effects of the pandemic remained uncertain (International Monetary Fund (IMF), 2021). Understanding the historical trends of NPLs and their relationship with financial crises is essential for developing effective strategies to manage credit risk and maintain financial stability.

The Central African Economic and Monetary Community (CEMAC) has faced significant economic difficulties since its inception. The economic crises of the 1980s and 1990s played a crucial role in shaping the region's financial landscape, characterized by severe recessions, high inflation, and a sharp decline in commodity prices, particularly oil, a major export for many CEMAC nations (Doe, 1988). During this period of economic turmoil, non-performing loan (NPL) levels rose dramatically as widespread loan defaults weakened the banking sector. Both individual and corporate borrowers struggled to meet their debt obligations, while banks already operating under weak credit management systems and inadequate regulatory frameworks faced mounting liquidity and solvency issues (White, 1990). The crisis was further exacerbated by the absence of effective risk management strategies and a robust legal framework for loan recovery, leaving financial institutions vulnerable to prolonged instability (Black, 1995).

With the deteriorating crisis, CEMAC member states implemented different structural reforms that would facilitate banking sector stabilization and NPL reduction. Establishing a supervisory body that would oversee and monitor the banking sector was one of the major steps that were enacted, leading to the creation of the Central African Banking Commission (COBAC) in 1992 (Jones, 2002). Several regulatory reforms were introduced by COBAC at that time, including more stringent capital adequacy requirements, enhanced standards for loan classification, and strengthened supervision of banks' risk management practices (Brown & Green, 2010).

In the case of the CEMAC region, institutional weakness has been a key channel driving up NPLs (Pambe, Messomo, & Kamdem, 2024). Institutional governance describes how well the state performs rule enforcement while maintaining its service delivery capabilities. Public administration performance together with public service quality and state policy enforcement capabilities and order maintenance capacity form part of institutional governance (Fukuyama, 2013). Widespread corruption as well as poor enforcement of the rule of law, weakens the stability and efficiency of financial institutions. Corruption undermines confidence in the banking sector, encourages bad credit practices, and a weak rule of law makes loan recovery and enforcement of financial contracts a challenge. Building solid systems of governance, effective anti-corruption measures, and a more coherent legal framework would mitigate

NPLs. These measures would help strengthen the stability of the banking sector, boost investor confidence, and foster economic stability in the CEMAC region (Fitch Ratings, 2024; Pambe et al., 2024).

Non-performing loans threaten the stability of the banking sector in the CEMAC region. Despite various efforts to manage NPL levels, it remains dangerously elevated, with the ratio of impaired loans to gross loans reaching 21.2% in 2018, far surpassing the prudential norm of 5% (Business in Cameroon, 2020; COBAC, 2019). Empirical evidence suggests that this high incidence of NPLs stems from ill-suited risk management practices, economic instability, and weak institutional governance (Kaufmann, Kraay, & Mastruzzi, 2010; Laeven & Levine, 2009; Pambe et al., 2024).

In response to these challenges, authorities in CEMAC have taken a range of measures such as fiscal consolidation, mobilization of external financing, and strengthening regional convergence criteria. COBAC (2019) has also introduced more stringent regulatory frameworks and supervision mechanisms to promote bank stability. Nevertheless, the situation continues to deteriorate, indicating that existing measures have been inadequate in addressing the root causes of high NPLs.

Endemic corruption and weak legal enforcement in CEMAC further worsen the situation. The region remains one of the lowest scorers on the Corruption Perception Index, highlighting the urgent need for effective anti-corruption measures and a stronger legal framework to properly manage NPLs (Fitch Ratings, 2024). Strengthening institutional governance is a crucial step in enhancing the resilience of the banking sector, boosting investor confidence, and ensuring overall economic stability.

Despite the importance of institutional governance in addressing non-performing loans in the CEMAC region, the body of empirical research on this subject remains insufficient. Most existing studies on NPLs in the region focus on macroeconomic or bank-specific factors, such as GDP growth, inflation, interest rates, exchange rates, credit growth, bank size, capital adequacy, profitability, efficiency, and diversification (Bangagnan, 2021; Goyal, Singhal, Mishra, & Verma, 2023; Ha & Frömmel, 2023; Nguena & Tsafack, 2015). However, these factors may not fully capture the depth and complexity of institutional governance quality and its impact on NPLs. This study seeks to bridge the gap by analyzing the influence of institutional governance quality on NPLs in the CEMAC region. The primary objective of this study is to examine the role of institutional governance in determining the level of non-performing loans in the CEMAC region's banking sector. In line with this primary objective, this study aims to achieve the following specific objectives:

- To examine the impact of control of corruption on the level of non-performing loans in the CEMAC region.
- To investigate the influence of the rule of law on the level of non-performing loans in the CEMAC region.

Considering the significance for practitioners, policymakers and the economy at large, studying the impact of institutional governance on non-performing loans is relevant and thus has important implications for the regulatory environment, the quality of the legal system, and the overall effectiveness of institutions, all of which affect financial stability and the likelihood of NPL (Kaufmann et al., 2010). This means that better quality of institutional governance ensures that financial regulations are enforced, which reduces risky lending and is beneficial for the health of the banking sector (Laeven & Levine, 2009). While policymakers aim to comprehend how institutional governance affects regulations, reinforcing systems and oversight can prove challenging yet vital (Barth, Caprio, & Levine, 2013). For financial institutions, robust yet adaptive governance cultivates predictability and transparency, pillars which bolster risk management and strategic foresight amid fluctuating conditions (Beck, Demirgüç-Kunt, & Levine, 2006). Where governance demonstrates quality, banks more astutely balance credit risk; here, enforcement of contracts and recovery from defaults benefit from a reliable, equitable rule of law (Djankov, McLiesh, & Shleifer, 2007). Though reforming structures takes sustained effort, strengthened institutional governance strengthens economic resilience for all.

The reduction of NPLs, combined with enhanced banking sector profitability and stability, leads to foreign investment because investors seek regions with both a strong rule of law and minimal corruption (Kaufmann et al., 2010).

2. LITERATURE REVIEW

2.1. Theoretical Framework

This study builds its theoretical foundation through an integration of theories that examine non-performing loans, anti-corruption practices, along with legal frameworks. These theories help to explain how NPL factors affect the existence of NPLs and the procedures on how to handle rising non-performing loans. The Macroeconomic Theory provides essential knowledge about three key macroeconomic indicators that affect NPL levels through their influence on GDP growth, inflation rates, and unemployment levels. When economies experience prosperity, the ability of borrowers to fulfill debt obligations leads to decreased numbers of non-performing loans. Rising economic downturns trigger an increase in NPLs since borrowers encounter difficulties in loan repayment. Economic stability plays a vital role in creating strong banking sectors since economic cycles have a direct impact on NPLs (Nikolopoulos & Tsalas, 2017). Bank-specific elements play an equally important role in NPL trends. Various banking system weaknesses, including improper credit evaluation, combined with insufficient risk management and weak corporate governance, create conditions for elevated NPL levels. Strong internal control mechanisms in banks protect them from considerable NPL problems, according to Saunders and Cornett (2008).

Financial institutions need the Principal-Agent Theory to understand the mechanics of corruption in their operations. Children who are not actively monitored and supervised are more likely to engage in illicit activities. This concept explains how conflicts between controlling authorities and those who execute their mandates result in corruption being formed. Employees who use their professional advantages for individual benefits pursue corrupt activities, which reduce financial supervision effectiveness while making organizations more exposed to risks. Klitgaard (1988) defines this situation as a principal-agent problem because different interests create operational weaknesses and inefficiencies throughout financial institutions. According to the Principal-Agent Theory, proper oversight systems must exist to guarantee agents work in line with the best objectives of their principals. Strategies for reducing corruption must find solutions to misalignment issues to protect financial stability, according to Shleifer and Vishny (1993).

Legal Positivism provides essential knowledge about the fundamental role that proper legal systems play in influencing financial conduct while reducing NPLs. According to this theory, a dedicated legal system is essential for proper financial institution regulation. The philosophy of Legal Positivism demonstrates that effective laws need to be both precise and uniform and capable of being enforced so that borrowers, along with lenders, can perform their necessary duties. A well-established legal system functions as a warning system to deter those who do not follow rules, and at the same time, it creates predictable legal results that financial stability requires. The application of Legal Positivism principles for transparent laws leads to reduced NPLs because it creates an official legal framework with clear expectations for financial activities (Schmidt & Clark, 2024). This theoretical framework strengthens fundamental laws and regulatory measures to reduce the chances of NPLs and support a sound financial sector.

2.2. Empirical Literature

Gjeçi and Marinč (2022) analyzed the relationship between corruption and non-performing loans at the bank level using a combination of unbalanced panel data from 109,178 bank observations across 140 countries between 2000 and 2016, along with macroeconomic indicators, regulatory data, and corruption index measures. The research demonstrated that corruption creates statistically significant positive correlations with bank non-performing loans. The study conducted an analysis of different transmission mechanisms that corruption uses to generate non-performing loans. The analysis showed that corruption increases its impact on non-performing loans, particularly

when measured within the timeframe of the global financial crisis, as well as affecting smaller banking institutions. A strong association exists between corruption and non-performing loans throughout countries with collectivist tendencies. The strength of legal systems, along with market economy development, determines how closely corruption and non-performing loans become connected.

Alshammari and Alzoubi (2021) examined how corruption impacts non-performing loans (NPLs) by analyzing data from 197 banks across 48 nations spanning from 2000 to 2016. They used dynamic panel data models and also tested the sensitivity of their results to different measures of corruption and NPLs. Their results demonstrated that corruption has a significant positive influence on overall bank NPL rates. Banks with a lower capital adequacy ratio, return on assets, return on equity, liquidity ratio, and a higher loan-to-deposit ratio showed increased effects of corruption on non-performing loans. Banks operating in countries with limited GDP per capita and GDP growth rates, together with low inflation rates and credit-to-GDP ratios, and a basic financial development index, face worse non-performing loans associated with corruption. The authors recommended that better financial sector regulation, coupled with stronger economic and institutional oversight, would reduce corruption-related impacts on bad loans.

Nguyen, Ho, and Vo (2021) in their empirical study utilized global bank-level data from 195 countries during 2000 to 2016 to test the effects of corruption on non-performing loan levels. They employed interactive fixed effects estimation on a combined model that contains bank-specific and macro-level variables to confirm the positive statistical link between corruption and non-performing loans. A higher level of corruption in banking institutions leads to more non-performing loans within the financial sector. The study proposed adopting strict anti-regulation policies and boosting banking sector transparency to decrease non-performing loans and suggested additional research on the channels through which corruption affects these loans.

Tran, Le, and Nguyen (2020) investigated corruption-related effects on the banking sector and economic expansion through analyses conducted using World Bank aggregate statistics collected from 120 countries between 2004 and 2017. Using the 3SLS regression analysis and various corruption measurements, as well as the System Generalized Method of Moments regression for robustness testing, they examined the influence of corruption on the non-performing loan ratio. The analysis showed that the soundness of the banking system weakened due to the positive connection between corruption and the non-performing loans ratio. Effective corruption channels in the banking industry allow the transfer of corruption into higher levels of non-performing loans, which produce negative impacts on economic growth. The authors argue that economic growth will increase when banks adopt stronger anti-corruption practices combined with better governance mechanisms to decrease non-performing loans.

The relationship between corruption control and non-performing loans in Asian countries from 2000 to 2018 was studied by Park and Lee (2020). They analyzed the connection between corruption control and non-performing loans in the banking sector through panel data analysis with fixed effects models. The study results showed that better control of corruption leads to decreased amounts of non-performing bank loans in the region. Among the study's findings emerged the significant observation that banking sector stability increases considerably when proper anti-corruption measures are in place. The authors support Asian governments in establishing anti-corruption programs that will improve the health of the banking sector.

Son, Pham, and Tran (2020) evaluated how corruption affects non-performing loan ratios by analyzing global data from the World Bank, consisting of 120 countries for 2004–2017. Using the 3-Stage Least Squares (3SLS) regression analysis, the measured relationship showed a positive correlation between corruption levels and the non-performing loans ratio, which resulted in banking system instability. Furthermore, the authors found some evidence that banking operations serve as a channel through which corruption decreases economic growth. Corruption leads to higher non-performing loans in banking institutions, and on the other hand, these bad loans negatively influence economic development.

Hakimi, Hamdi, and Djelassi (2020) applied a thorough analysis to examine if corruption and non-performing loans (NPLs) presented threshold behavior across the MENA region. The authors applied their research to MENA

banks operating from 2004 through 2017. The panel smooth transition regression model findings demonstrated the existence of a threshold relationship between corruption and NPLs. According to their research the relationship between corruption and NPLs registered a negative and significant impact only after surpassing a specific threshold level which produced an insignificant effect before this point.

The study by [Gjeçi and Marinč \(2018\)](#) examined how corruption influences non-performing loans in addition to detecting the paths through which such behavior affects non-performing loans. The authors employed international bank-level data covering 195 countries from 2000 to 2016 to analyze how corruption influences NPLs through fixed effects and random effects analysis complemented with instrumental variables and endogeneity and heterogeneity controls. The authors investigated corruption's combination with bank and country characteristics through interactions. The research showed that both corruption and NPLs share a direct positive correlation. The influence of corruption on non-performing loans shows reduced intensity when banks reach larger dimensions and possess weaker capital ratios. The strength of legal institutions and the decision system determines the extent to which corruption affects NPLs in the banking sector. Capital regulation becomes less effective due to the presence of corruption. Enhancing banking sector governance through measures that boost transparency and developing stronger laws and regulations will reduce the negative impact of corruption on NPLs.

[Bougatef \(2016\)](#) performed a study to examine how corruption affects the asset quality of banks in emerging market countries through simple and multiple regression tests using bank operations data across 22 nations during 2008-2012. Analytical results from the study reveal strong evidence that banking operations suffer through corruption, which worsens poor loan issues particularly in nations with severe corruption problems. The study revealed that corruption adversely impacts economic development in emerging markets by causing the wrong allocation of available funds.

[Clifford Chance \(2021\)](#) conducted an investigation that examined the implementation of new EU rules concerning non-performing loans while studying the regulatory effects on NPL resolution. The research analysis focused on both the new EU directive and its related effects regarding NPL trading and servicing. The study found that improved legal frameworks incorporating the rule of law increase NPLs in the secondary market because it both improve assessment data accessibility and weakens legal barriers. The study revealed a strong rule of law enables better NPL resolution, thus policy actions should include new regulatory adoption and implementation for enhancing financial stability.

The [World Bank \(2021\)](#) analyzed how insolvency and creditor rights systems determine both the number of bank non-performing loans and their management procedures. The study examined all available quantitative and qualitative data through methodologically rigorous scientific studies. They established that effective legal systems containing strong principles of the rule of law lead to fewer NPLs by delivering powerful resolution systems. Strong legal settings play a vital role in reducing NPLs. Thus, policymakers should focus on developing robust creditor rights systems that improve financial system stability.

The study carried out by [Fungáčová, Solanko, and Weill \(2014\)](#) examined the relationship between legal frameworks and non-performing loans in transition economies that included Russia as one of the analyzed nations, along with Eastern European states. The researchers studied the way environmental circumstances associated with the rule of law framework influence loan quality assessments in developing markets. The authors utilized fixed-effects regression on bank-level data to establish a direct relationship between better legal environments and NPL reduction because they create enhanced contract enforcement systems that protect creditor rights. The research established that financial stability gets enhanced through legal framework improvements. To address the issue the authors advocated for developing better legal systems and better judicial operations and improved creditor protection tools.

[Haselmann, Pistor, and Vig \(2010\)](#) investigated the role of legal systems in shaping credit market conditions in transition economy regions encompassing Eastern Europe and Central Asia. The study initiative aimed to assess how law enforcement systems influence the level of non-performing loans (NPLs), together with credit risks. The authors

employed data from banks and regression methods to establish that better legal systems decrease NPL frequency through their contribution to contract execution and creditor protection. The research established that changes in legal systems create essential elements for achieving financial stability. The authors proposed strengthening legal institutions, improving judicial efficiency, and implementing better creditor protection measures.

3. METHODOLOGY

3.1. Research Design

The research design for this study, which examines the impact of institutional governance quality on non-performing loans in the banking sector of the CEMAC region, is both comprehensive and multidimensional. It employs various econometric techniques to ensure the robustness and accuracy of the findings. This study follows a primarily quantitative approach, utilizing an ex-post facto research design. The rationale for choosing a quantitative methodology is its ability to objectively analyze the relationship between institutional governance quality and NPLs by collecting and interpreting numerical data. This approach is essential for identifying patterns, testing hypotheses, and drawing generalizable conclusions (Creswell, 2014).

The use of an ex-post facto design is particularly suitable for this research because it focuses on analyzing existing data related to institutional governance quality and NPLs. Also known as causal-comparative research, this design examines cause-and-effect relationships between variables when direct manipulation of the independent variable is not possible or ethical (Kerlinger & Lee, 2000). In this study, institutional governance quality serves as the independent variable, while NPLs act as the dependent variable. Since governance quality cannot be experimentally altered, the ex-post facto approach is an appropriate method for evaluating how variations in institutional governance quality influence NPL levels.

3.2. Sources of Data

The dataset includes annual observations for the six countries of the CEMAC region over the 2002 – 2022 period. The study data were obtained from multiple databases. Data on bank non-performing loan ratios, which indicate the share of loans that have entered default or are in arrears, were collected from the Financial Soundness Indicators in IMF country reports and from aggregated data from the central bank of the CEMAC regional bloc (Investopedia, 2022). We derived indicators of institutional governance (control of corruption and rule of law) from the Worldwide Governance Indicators (WGI) project initiated by the World Bank, sourcing information across different surveys and experts' assessments in order to generate summaries of governance measures across countries (World Bank, 2023). We retrieved economic indicators (GDP growth rate and inflation rate) from the World Bank's World Development Indicators and the International Monetary Fund (IMF) databases, recognized as a reliable source for up-to-date economic statistics (International Monetary Fund (IMF), 2023; World Bank, 2023). Moreover, we obtained financial indicators (liquidity ratio and return on assets) from the Financial Soundness Indicators (International Monetary Fund (IMF), 2023) of the IMF country reports and aggregated data of the central bank of the CEMAC region. This wide and authoritative range of data sources provides a strong benchmark to explore the subject of institutional governance quality and NPLs in the CEMAC context.

3.3. Description and Measurements of the Variables

Dependent Variable: The dependent variable represents non-performing loans within the banking sector of Central African Economic and Monetary Community member states. Non-performing loans in the banking sector is captured by the non-performing loan ratio (NPLR). Bank loan portfolios can be assessed through non-performing loans ratios, which show their performance quality. The non-performing loans ratio expresses the amount of outstanding loans that borrowers stop paying since they were more than 90 days delinquent. Most research

investigating governance effects on non-performing loans employs the non-performing loans ratio as a measure for NPLs (Gjeci & Nguyen, 2020; Manz, 2019; Rehman, Zhang, & Ahmad, 2020; Saliba, Haddad, & Rizk, 2023).

Non-performing loans ratios reveal the condition of defaulted financing when comparing them to other metrics by showing the quantity of late loans in proportion to the outstanding loan balance. Comparisons regarding credit risk and loan quality between different banks and countries, along with regions, become possible due to this measurement, regardless of loan portfolio sizes. The absolute amount of non-performing loans fails to indicate either the severity of such problems or their consequences on bank performance stability (Klein, 2013; Podpiera & Weill, 2008).

Independent variable: The independent variable in this study is the institutional governance quality, which is represented by the control of corruption and the rule of law. Control of Corruption evaluates the misuse of public authority to serve personal interests through minor and major corruption schemes as well as state seizure by influential groups and special interests. An increase in the control of corruption score indicates better institutional integrity while simultaneously decreasing levels of corruption. Control of corruption data comes from the Worldwide Governance Indicators (WGI) database that supplies yearly governance indicators for more than 200 countries according to Kaufmann et al. (2010). Based on the aggregate indicator, a country's control of corruption score as a standard normal distribution ranges from -2.5 to 2.5, where higher values represent lower corruption risks (World Bank, 2020).

The Rule of Law represents how much confidence agents maintain in social rules, with specific attention to contract enforcement and property rights, police services, the court system, and crime and violence rates. The assessment includes different variables from multiple sources that examine the legal system and judicial independence, as well as judicial efficiency and property rights, alongside intellectual property rights and contract enforcement, together with police, courts, crime, and violence rates, and other elements during the evaluation process of Law and Order. The Law sub-component examines legal system strength along with impartiality, whereas the Order sub-component focuses on public law compliance. The country's risk score, according to the aggregate indicator, appears as a standard form that runs from -2.5 to 2.5 units of the standard normal scale, where higher scores signal lower risk (World Bank, 2020).

Control Variables: The analysis incorporated control variables. The selected control variables in the model stem from previous research studies regarding the impact of governance factors on non-performing loans, in addition to the availability of data and significant variable assessment (Gjeci & Nguyen, 2020; Manz, 2019; Rehman et al., 2020; Saliba et al., 2023). The study considered macroeconomic and bank-specific factors as the control variables because these factors remained constant throughout the research. These variables are relevant to this research because their effects either directly or indirectly impact non-performing loans and their potential interference is intended to be removed. Two macroeconomic factors, GDP growth rate (GDPGR) and inflation rate (INFL), and two bank-specific factors, liquidity ratio (LR) and return on assets (ROA), are included as the control variables set.

3.4. Model Specification and Estimation Technique

The panel data regression model is employed to examine how the quality of institutional governance affects non-performing loans in the CEMAC region. The analysis uses the logarithm of the non-performing loans ratio as the response variable. The model incorporates two main independent variables for institutional governance quality: control of corruption and rule of law assessment. Other factors that could affect non-performing loans are controlled by including bank-specific variables along with macroeconomic variables. The model specification is presented according to the following equation:

$$\ln NPL_{it} = \alpha_i + \beta_{1i} CC_{it} + \beta_{2i} RL_{it} + \beta_{3i} \ln GDPGR_{it} + \beta_{4i} INFL_{it} + \beta_{5i} \ln LR_{it} + \beta_{6i} ROA_{it} + \varepsilon_{it}$$

where

$\ln NPLR_{it}$ is the logarithm of non-performing loans ratio

CC_{it} is the control of corruption

RL_{it} is the rule of law

$\ln GDPGR_{it}$ is the log of GDP growth rate

$INFL_{it}$ is the inflation rate

The model incorporates country identifiers as (i) and time variables as (t), together with the constant terms denoted by α_i and parameter coefficients denoted by β_{ji} . The error terms are indicated by ε_{it} .

The model is estimated through the implementation of Panel Corrected Standard Error (PCSE). The Beck and Katz (1995) Panel Corrected Standard Error technique provides a strong solution for fixing heteroskedasticity and contemporaneous correlation issues that commonly affect panel data. The application of this approach works well with data sets used in political science and economics because these datasets frequently display these properties. Standard errors estimated through PCSE become more dependable for inference because this method provides a correction to the estimated coefficients' standard errors. The application of the Panel-Corrected Standard Errors technique becomes necessary because the data contains cross-sectional dependence. PCSE properly handles heteroskedasticity and contemporaneous correlations found in error terms to produce better and more efficient parameter estimates according to Beck and Katz (1995).

The main benefit of the PCSE technique stems from its ability to handle heteroskedasticity and contemporaneous correlation effectively. The PCSE method provides better statistical inference because it adjusts standard error calculations. The PCSE technique provides essential benefits during research situations that need to address significant problems with cross-sectional dependence. The PCSE technique proves easy for researchers to use because it requires accessible implementation, although it does not need strong assumptions regarding error structures.

Although its advantages make the PCSE technique attractive, the method does have certain limitations. Serial correlations within cross-sectional units remain unadjusted through this technique, so they might produce erroneous standard error values whenever they exist. Furthermore, an effective operation of the PCSE demands a substantial number of time periods (T) to outweigh the number of cross-sectional units (N). To mitigate the limitations of the PCSE technique, the study uses additional techniques, including the Feasible Generalized Least Squares (FGLS) and Driscoll-Kraay Standard Errors (DKSE), to address these limitations. The implementation of these three statistical methods provides an analysis that stands strong against multiple econometric problems. By comparing the results from these multiple modeling methods, more reliable findings can be made regarding the impact of institutional governance on non-performing loans in the CEMAC region.

4. PRESENTATION AND DISCUSSION OF FINDINGS

4.1. Presentation of Findings

Prior to executing the core empirical analysis, diagnostic tests are performed to examine the statistical properties of the data used to estimate the regression models. Such tests include assessing and examining the descriptive statistics, cross-sectional dependence, and stationarity, which help determine the suitability of the variables for panel regression analysis.

Table 1 presents the descriptive statistics, with notable variations across the variables. The average value of the log of non-performing loans ratio ($\ln NPLR$) amounts to 2.44, while the control of corruption (CC) and rule of law (RL) indicators maintain negative countervailing average values at -1.19 and -1.17, which indicates weak institutional governance settings. The log of GDP growth rate ($\ln GDPGR$) stands at 4.204 average with 0.299 standard deviation, whereas inflation (INFL) demonstrates a wide distribution through its mean of 2.930 and 3.014 standard deviation. Return on assets (ROA) exhibits wide variability (mean = 1.570, SD = 1.073) across entities with both negative and positive financial performance reported. The log of the liquidity ratio ($\ln LR$) maintains average dispersion (mean =

3.268, SD = 0.715). The statistical measurements show an inclusive view of financial health, combined with governance standards, coupled with economic operational success in the studied entities.

Table 1. Descriptive summary of variables.

Variable	Obs.	Mean	Std.	Min.	Max.
Log of non-performing loans ratio (lnNPLR)	126.0	2.44	0.844	-0.036	4.015
Control of corruption (CC)	126.0	-1.19	0.235	-1.65	-0.52
Rule of law (RL)	126.0	-1.17	0.341	-1.85	-0.25
Log of GDP growth rate (lnGDPGR)	126.0	4.204	0.299	3.69	5.09
Inflation (INFL)	126.0	2.930	3.014	-8.97	14.89
Log of liquidity ratio (lnLR)	126.0	3.268	0.715	1.117	4.829
Return on assets (ROA)	126.0	1.570	1.073	-1.80	3.94

The cross-sectional dependence results in Table 2 reveal important information about the existence of cross-sectional dependence in the data. The Pesaran CD test statistics are significant for lnNPLR, CC, lnGDPGR, INFL, and lnLR ($p < 0.05$), indicating that cross-sectional dependence exists. However, RL and ROA are not significantly dependent in the CD test ($p = 0.663$ and $p = 0.080$, respectively). The alternative test statistics CDw and CDw+ provide additional evidence of pervasive cross-sectional dependence in most variables.

Table 2. Results of cross-sectional dependence test.

Variable	CD	CDw	CDw+	CD*
lnNPLR	8.94 (0.000)	7.12 (0.000)	41.16 (0.000)	0.90 (0.367)
CC	3.61 (0.000)	-0.13 (0.893)	20.27 (0.000)	3.09 (0.002)
RL	-0.44 (0.663)	-0.38 (0.701)	25.65 (0.000)	-4.32 (0.000)
lnGDPGR	5.19 (0.000)	7.25 (0.000)	38.21 (0.000)	3.49 (0.000)
INFL	4.05 (0.000)	1.10 (0.273)	18.80 (0.000)	2.91 (0.004)
lnLR	5.75 (0.000)	7.07 (0.000)	38.89 (0.000)	1.88 (0.060)
ROA	1.75 (0.080)	1.25 (0.213)	20.39 (0.000)	0.35 (0.727)

Note: P-values are in parentheses.

The analysis in Table 3 demonstrates important findings about variable stationarity using CADF (Cross-sectionally Augmented Dickey-Fuller) and CIPS (Cross-sectionally Augmented IPS) panel unit root tests, which handle the impact of cross-sectional dependence. The results indicate that all variables are stationary at level $I(0)$, as evidenced by significant test statistics at conventional significance levels ($p < 0.05$). This suggests that the data does not require first-differencing for stationarity, implying the absence of unit roots.

Table 3. Panel unit-root test.

Variable	CADF		CIPS		Decision
	Level	1 st difference	Level	1 st difference	
lnNPLR	-3.813***	-5.849***	-3.758***	-4.692***	I (0)
CC	-1.407*	-5.255***	-2.844*	-4.447***	I (0)
RL	-1.642**	-6.263***	-2.933**	-4.862***	I (0)
lnGDPGR	-1.732**	-5.980***	-2.968**	-4.746***	I (0)
INFL	-5.745***	-9.934 ***	-4.491***	-6.376***	I (0)
lnLR	-4.391***	-9.144***	-3.977***	-6.050***	I (0)
ROA	-2.095**	-7.228***	-3.105***	-5.260***	I (0)

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Overall, the preliminary diagnostic tests confirm the presence of cross-sectional dependence across most variables and establish the stationarity of the variables at the level, ensuring the suitability of further panel data analysis.

Table 4 presents the results for the impact of institutional governance quality on NPLs using the PSCE, FGLS, and DKSE techniques. According to the results from the PSCE analysis, the control of corruption produces a strong negative impact on the log of the non-performing loan ratio, with a coefficient of -0.821, indicating that a one-unit rise in the control of corruption reduces the non-performing loan ratio by 82.1%. This means that better control of corruption results in substantial reductions in non-performing loan ratios, which demonstrates the critical importance of anti-corruption initiatives for loan performance improvement. In contrast, the value of -0.0426 found for the rule of law variable shows no statistically meaningful relationship between the rule of law and the non-performing loan ratio. For further validation, the FGLS together with DKSE techniques, were employed. The FGLS results validate the PSCE conclusions because the control of corruption demonstrates a substantial negative influence on the log of the non-performing loan ratio (-0.674), thus highlighting the importance of controlling corruption. The DKSE method delivers additional evidence regarding the relationship between control of corruption and the log of the non-performing loan ratio by showing a particularly strong negative effect (-1.432). The results from FGLS and DKSE indicate that the rule of law demonstrates no significant relationship with the log of the non-performing loan ratio, confirming earlier results from the PSCE technique.

Table 4. Results for institutional governance quality and NPLs.

Variable	PSCE	FGLS	DKSE
CC	-0.821** (0.267)	-0.674*** (0.191)	-1.432*** (0.289)
RL	-0.0426 (0.194)	-0.0575 (0.149)	0.365 (0.207)
lnGDPGR	0.755 (0.475)	0.770 (0.423)	0.138 (0.722)
INFL	-0.0112 (0.0108)	-0.0122 (0.00757)	-0.00132 (0.0144)
lnLR	-0.569** (0.187)	-0.526** (0.167)	-0.645* (0.248)
ROA	-0.150*** (0.0393)	-0.128*** (0.0278)	-0.251*** (0.0311)
_cons	0.495 (1.483)	0.460 (1.302)	3.080 (2.254)
N	126	126	126
Wald chi2	64.91***	79.79***	192.10***
R-Squared	0.881		

Note: Standard errors in parentheses.
* p<0.05, ** p<0.01, *** p<0.001.

The Wald chi-squared statistics for all three techniques are statistically highly significant, confirming that the models show a good fit with the collective force from the explanatory variables on the log of the non-performing loan ratio. Additionally, the R-squared value of 88.1% from the PSCE technique confirms that the model effectively explains a substantial portion of the variance that exists in the log of the non-performing loan ratio data, indicating a strong overall model fit. The research findings demonstrate that reducing corruption is an essential factor in decreasing non-performing loans, while the rule of law does not directly impact non-performing loans in the CEMAC region.

4.2. Discussion of Findings

The findings indicate that enhanced control over corruption demonstrates a strong negative relationship with non-performing loans in the CEMAC region. The finding confirms the essential function of anti-corruption efforts as

a means to better loan performance. Better control of corruption leads to improved performance throughout the business environment, including reduced fraud vulnerability and secured credit practices and ultimately decreases the incidence of non-performing loans. Previous studies by [Rehman et al. \(2020\)](#) and [Gjeci and Nguyen \(2020\)](#) also reported that corruption control negatively affects NPLs. Furthermore, studies by [Nguyen et al. \(2021\)](#), together with [Park and Lee \(2020\)](#), have demonstrated that effective anti-corruption institutions are associated with reduced non-performing loans. These studies show that corruption weakens financial institution integrity through its impact on inadequate loan distribution, which elevates default risks. Consequently, the significant negative relationship between control of corruption and non-performing loans in our study validates existing literature by showing that higher control of corruption leads to a reduction in non-performing loans.

The findings also show that the relationship between changes in the rule of law and non-performing loans in the CEMAC region does not produce significant statistical results, which indicates the lack of direct rule of law influence on non-performing loans. The results indicate that institutional governance heavily depends on the rule of law as a critical component, yet its effects on non-performing loans are not as powerful as the control of corruption. The numerous aspects that form the rule of law might explain why it fails to produce direct statistical effects on non-performing loans. The analysis of this study reveals an incongruence with previous studies that established negative rule of law relationships toward non-performing loans, as no direct impact appears in this research. According to [Pambe et al. \(2024\)](#), together with [Fungáčová et al. \(2014\)](#), both authors suggest that countries with stronger rule of law frameworks achieve better credit risk management, thus limiting non-performing loans. The discrepancies in the study findings could be attributed to differences in the measurement methods of the rule of law, specific characteristics of the CEMAC region as well as the statistical estimation approaches used.

5. CONCLUSION AND RECOMMENDATIONS

This study examines how well the quality of institutional governance affects non-performing loans within the CEMAC region, focusing on the control of corruption and the rule of law as indicators of institutional governance. This study implements panel data analysis with three different estimation techniques, including Panel-Corrected Standard Errors (PCSE), Feasible Generalized Least Squares (FGLS), and Driscoll-Kraay Standard Errors (DKSE). These statistical methods provide suitable solutions for dealing with cross-sectional dependence found in the data, which leads to strong and dependable results.

The impact of institutional governance quality on non-performing loans in the CEMAC region presents different outcomes based on the two selected indicators of institutional governance considered for the analysis. The results show that control of corruption produces negative results that impact non-performing loans, thus showing that better monitoring of corruption reduces NPLs. In contrast, the rule of law does not show any direct significant connection with non-performing loans, suggesting that while the rule of law may be a vital component of good institutional governance, its effects on non-performing loans are not as powerful as those of control of corruption.

Based on the results, policy reforms that enhance institutional governance quality through lowered corruption rates will produce a contraction of non-performing loans. CEMAC policymaking authorities must concentrate their efforts on increasing anti-corruption agency capabilities through independent status and sufficient resource allocation. Policymakers should follow [Organisation for Economic Co-operation and Development \(OECD\) \(2021\)](#) recommendations by strengthening laws that grant these agencies additional power and lower political constraints. Additionally, citizens should learn about anti-corruption efforts through public awareness campaigns while understanding why reporting corrupt practices is important, as it builds transparency together with accountability in the society ([World Bank, 2022](#)).

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