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Prudential Regulation in Strengthening the Financial Capacity of Congolese Banks

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Abstract

Prudential regulation is crucial for banking oversight, ensuring sector safety and stability. However, its tools are debated. Comparing literature is key, as banking's unique characteristics drive regulation. Traditional theories, like state preference and portfolio choice, assume complete and perfect markets, making them ill-suited for banking specifics. New "optimal regulation" models incorporate information asymmetries to better address these specifics, though only partially. This evaluation highlights the need for theoretical approaches that fully account for the unique nature of banking.

Keywords

Congolese Banks, Financing the Economy, Congolese Prudential Regulation, Banking Capacity, Financial Stability

1. Introduction

According to Aglietta & De Boissiéu (2004), prudential regulation encompasses all legal measures put in place by national authorities (central banks, regulatory and oversight bodies, etc.) and imposed on banking and financial institutions (Masingo, 2023; Masingo et al., 2023; Nduwimana & Sindayigaya, 2023b; Sindayigaya, 2023a, 2023b). Its goal is to ensure the stability of the banking and financial sphere by enhancing its resilience to various shocks and by protecting savers (David et al., 2023; Ndayisenga & Sindayigaya, 2024; Nduwimana & Sindayigaya,

2023a; Sindayigaya, 2022, 2024a).

The study conducted by Avom & Bobbo (2018) shows that the prudential framework in force in the CEMAC region is the result of dysfunctions that led to bank failures at the end of the 1980s, as well as institutional reforms driven by the demands of financial liberalization that began in the early 1990s (Nyabenda & Sindayigaya, 2023, 2024; Sindayigaya, 2023a; Sindayigaya & Nyabenda, 2022). Building on the Basel Accords and the specificities of the economies of the sub-region, this new framework merits recognition for integrating both quantitative and qualitative aspects of banking regulation (Milenge, 2023; Mperejimana & Sindayigaya, 2023; Sindayigaya, 2024a). The author also finds that the high costs of bank credits and the requirements for guarantees also prove to be regulatory constraints limiting access to financial services offered by credit institutions in the CEMAC (Avom & Eyeffa Ekomo, 2007; Beck & Cull, 2014; Kahla et al., 2007).

On the other hand, the impact of banking regulation on the risk of bank failures in the WAEMU is explored by Pascal H. Dannon and Frédéric Lobez. They begin by discussing the specifics of banking regulation in the WAEMU and the status of banks in relation to prudential norms (Victor et al., 2023; Forbes, 2019; Mperejimana & Sindayigaya, 2023; Ndericimpaye & Sindayigaya, 2023; Sabiraguha et al., 2023; Sindayigaya, 2020). Subsequently, they specified an econometric model in which they estimated over the period 2000-2010 and arrived at results indicating that: compliance with certain prudential norms remains weak and some of these norms are not in accordance with international provisions; banks with a higher capital ratio, those that focus on lending, those that allocate a relatively larger portion of their asset value to personnel expenses, as well as larger banks, have a lower probability of failure; banks that have a high level of subordinated debt and hybrid capitals face a greater risk of failure; and finally, an increase in GDP contributes to reducing the risk of bank failure, a relatively high share of the financial sector in GDP poses an increased risk of default (Avom & Eyeffa Ekomo, 2007; Beddewela, 2019; Lubin, 1995).

Economic theory provides substantial reasoning to explain the vulnerability of financial systems and their fragility in the face of confidence crises, particularly when they are subjected to the effects of leverage. Financial theory, especially the literature dedicated to banking theory, has focused on the reasons behind the proliferation of derivative products, the emergence of financial engineering, and the development of banking management (Sindayigaya & Toyi, 2023a, 2023b; Toyi & Sindayigaya, 2023). It was not until the 1980s that a theoretical framework was established, with numerous empirical studies focusing on the behavior of banks under regulatory management (Jonya et al., 2023, 2024). Within the firm, compliance with prudential requirements has both benefits and costs. According to estimates by PECK et al., the costs represent about 5% of the assets of banking and microfinance institutions during the first year of compliance.

Most regulations require that banking and microfinance institutions submit

financial data to the authorities responsible for supervision (De Marco et al., 2021; Sindayigaya, 2024a). This involves regular and high-quality communication. Banking and microfinance institutions struggle to attract and recruit specific skills to ensure the quality and regularity of reporting. Furthermore, regulation simplifies the access of banking and microfinance institutions to external financing sources such as debt and equity. It allows unregulated banks and microfinance entities the opportunity to collect deposits and tap into public savings to adjust their financial system. According to Jensen (1993), regulation is considered a tool of external governance intended to address the shortcomings of internal control systems. Banking and microfinance institutions are distinct from non-financial organizations due to their regulation. In an ideal market where resource allocation is optimal and information is equally shared among all actors, there is no need for an external force tasked with punishing, rewarding, or penalizing organizations that adopt aberrant and dysfunctional behaviors; the market self-regulates. However, in reality, information asymmetry between organizations and borrowers leads to opportunistic behaviors from managers and bank owners, regardless of their size, institutional structure, or role in the economy (Skarzauskas, 2021 and Chateau, 2016).

The second school of thought argues that prudential ratios only contribute to improving the bank's performance, measured by profitability. However, many authors have nuanced this idea by including a risk weighting of bank assets in the ratios they study. According to Kim & Santomero (1988), Buser et al. (1981), and Benston & Kaufman (1986), it is acknowledged in the literature that banks tend to opt for portfolios with higher levels of risk. According to Rochet (1992), commercial banks cannot be constrained to choose certain types of portfolios, including the riskiest ones, if their objective is to maximize the market value of their future profits.

Furthermore, according to Blume et al. (1999), regulatory constraints can lead to increased productivity in banking activities from a dynamic perspective. It highlights that one consequence of such regulation is to decrease the bank's profits, which compels the bank to restrict the default risk it can take. Risks associated with bank runs alone justify the existence of banking regulation, as they cause significant social impact while leading to significant external consequences on the economy as a whole.

In the Democratic Republic of Congo (DRC), the regulation of banking and non-banking institutions is governed by the following laws: Law No. 003/2002 of February 2, 2002, "on the activity and control of credit institutions," replacing Ordinance-Law No. 72-004 of January 14, 1972, "on the protection of savings and the control of financial intermediaries," also known as the "Banking Law." This legislation is supposed to take into account the new context that has marked the banking profession, namely: the globalization of financial activities, the interconnection of markets, and the increasingly advanced computerization of management.

When an institution receiving deposits becomes insolvent, it no longer has the ability to repay its depositors, and if it is of significant size, its bankruptcy can lead to a significant deterioration of the banking system's image in the eyes of the public, causing a movement of massive withdrawals. With prudential regulation, it is therefore possible to compel public authorities to monitor the financial solvency of regulated institutions, ensuring that institutions that have been licensed remain solvent or cease accepting deposits if they become insolvent. This regulation aims primarily to ensure the soundness and stability of the financial system, and to protect the deposits of small savers through the supervision of standards set by specialized financial authorities.

The criteria to be respected include registration, annual publication of accounts, external audit, transparency on effective interest rates applied, etc., with the most important being: the minimum level of capital, adequacy of equity, limitations on unsecured credit volume and provisions for doubtful debts, requirements concerning reserves and liquidity, mandatory clauses regarding shareholding and diversification. Given that the dysfunctions of banks and their low capacity have major consequences on the economies of both developed and developing countries, and in order to address financial risks that may affect our Congolese banking sector, the Central Bank of Congo has adopted a specific regulatory framework for Congolese banks, which incorporates the main recommendations from the Basel Committee's work (Elias T. Ayuk and Georges Kobou).

The Central Bank of Congo, considered the bank of banks, organizes and manages a risk center and a bad debt center, and ensures compliance by banks and financial institutions with legislative and regulatory provisions, as well as all security measures set forth in prudential regulation, for better stability and balance of the banking system. With the implementation of new control and surveillance measures set out by the law on currency and credit, it has been essential to follow the directives by the development of regulatory texts issued by the Central Bank of Congo as a key and important actor in controlling the Congolese banking system (Mastaki, n.d.). To do so, Congolese banks and financial institutions are required "to comply with standards and ratios applicable to banks and financial institutions, particularly in terms of risk coverage and distribution, liquidity, solvency, and general risks."

The main objective of the Central Bank of Congo's (BCC) monetary policy is to ensure monetary stability, which is divided into two sub-objectives: internal stability (low inflation) and external stability (sufficient external currency coverage rate). The BCC's statutes also allow the central bank, without prejudice to its objective of monetary stability, to support the general economic policies developed by the government to encourage economic growth. To achieve its objectives, the BCC: uses its main instrument, the key interest rate (TDIR); acts on the amount of credit through the capping of commercial bank interest rates; and manipulates the required reserve ratio. It is therefore essential for the BCC to know if its actions affect its main variables of interest, namely: inflation, foreign

exchange reserves (or the external currency coverage rate), and economic activity (Katuala, 2020).

Banking system supervision is organized around the following bodies:

The Banking Regulation Committee, supervised by the Minister of Finance who chairs it, and coordinated by the Governor of the Central Bank of Congo (B.C.C.). It is responsible for the general rules applicable to credit institutions, including capital requirements, network establishment conditions, customer transactions, liquidity and solvency rules, etc.

The capital adequacy ratio corresponds to the proportion of equity that a credit institution must hold in relation to its risk-adjusted assets. Basel I agreements set this ratio at 8%, a rate difficult to apply to MFIs since it was designed for financial institutions not exposed to the same risks (Nilsson et al., 1997). It seems more appropriate to impose higher capital adequacy standards on MFIs than those imposed on banks, considering the specificities of their activities, mainly characterized by a lack of collateral. In Latin America, this rate is higher than 15%.

A bank's solvency is understood as its ability to meet, solely with its different equity, various commitments to its clients and other external financial partners Naranchimeg and Enkhamgalan (2020). This ratio allows the analyst to assess the bank's ability to cover all its risks weighted by its equity, without resorting to mandatory reserves. Financial intermediaries are subject to a capital adequacy ratio ("solvency ratio"), which has been an international standard since the work carried out by the BIS in the 1970s. Credit institutions must therefore comply with the Cooke ratio (Basel I agreements) or the Mac Donough ratio (Basel II agreements), requiring coverage of at least 8% of their assets weighted by their net equity (Lhériau, 2009). For the solvency ratio, set at a minimum of 10%, banks are not allowed to use internal models. It should be noted that requirements for market risk and operational risk are multiplied by 10 for their inclusion in the denominator of the ratio and not by 12.5%. Three types of capital buffers are provided: conservation buffer, countercyclical buffer, and systemic institutions. As of 2021, only the conservation buffer, amounting to 2.5%, had been activated. The implementation of the other two was postponed due to the pandemic, although the Central Bank of Congo determined that four institutions were of systemic importance and should be subject to a buffer ranging from 1 to 2%. The minimum level of the leverage ratio has been set at 5%.

Equity reserves = Solvency ratio = ≥ 8% Equity points

This ratio aims to prevent a strong concentration of risks on a single beneficiary or group of beneficiaries, which in the event of insolvency could cause significant losses to the bank. It comprises two ratios:

- Single-beneficiary risk ratio: where the amount of risk on a single beneficiary must not exceed 25% of the bank's or financial institution's net equity.
- Group-beneficiary risk ratio: which is the total commitments incurred on beneficiaries, each of whom has received assistance exceeding 15% of the institution's

net equity. The total of these commitments must not exceed 10 times the institution's net equity (Muayila et al., 2022).

This ratio must be calculated as of December 31 of each year and is measured by the ratio between equity and permanent resources and that of permanent employment. It must be at least equal to 60%. Finally, it aims to limit transformation in the medium and long term and to maintain the balance between long-term employment and resources in the national currency.

Instruction No. 74 - 94 of November 29, 1994, concerning the establishment of prudential management rules for banks and financial institutions, established a system of classifying receivables based on clients' repayment capacity at the scheduled maturity. There are two types of receivables: current receivables and classified receivables.

According to Demey et al., liquidity risk is defined as: "the risk, for a bank, of not being able to meet its commitments at a given time or not being able to finance the development of its activities." For Congolese regulations, liquidity risk is the risk of not being able to meet its commitments or not being able to unwind or offset a position due to market conditions within a specified period and at a reasonable cost. To mitigate this risk, the bank must calculate the following ratio:

Liquidity ratio = Availability on demand or at a maturity of one month or more ≥ 1 emand or maturity of one month or more

Under this new regulation, entities are required to continuously meet the solvency ratio, which has a minimum standard set at 10%. This ratio is calculated as the amount of prudential equity over the total of risk-weighted assets. The denominator of the ratio includes all asset items and off-balance sheet commitments, except for the items deducted from prudential equity according to the provisions in articles 8 and 9 of the present Instruction. In calculating the solvency ratio, asset items and off-balance sheet commitments are assigned weighting factors of 0%, 20%, 25%, and 100%, depending on whether they present a high, medium, moderate, or low risk.

Therefore, we can conclude that the new regulation aims to strengthen capital requirements by incorporating additional risks that were not previously considered, namely market risk and operational risk. The numerator of the solvency ratio consists of regulatory capital. The denominator includes the sum of weighted exposures for credit, operational, and market risks; credit risks include both on-balance and off-balance sheet risks.

In this subsection, we will analyze the impact of regulatory compliance on strengthening financial capacity in Congolese banks in the Democratic Republic of the Congo (DRC). Therefore, we will focus on two points: a recap of the research hypotheses and the analysis and interpretation of these hypotheses.

From these studies, our paper aims to determine the role of prudential regulation in strengthening the financial capacity of banks in the Democratic Republic of Congo. To achieve this, the present study proposes to explore answers to the following questions:

- What is the level of efficiency of Congolese banks regarding prudential management standards?
- Can prudential regulation improve the efficiency of Congolese banks?

2. Methodology

The ordinary least squares method is used to identify the model of the problem. We will evaluate an autoregressive distributed lag model (ARDL) to determine whether prudential regulations in banks in the DRC have a significant impact on their financial capacity, and thus infer that they are also important tools for managing Congolese banks. Two previous models have grouped the characteristics of these types of models and are called "staggered or distributed lag autoregressive models," or ARDL model in English. The different forms are:

$$\text{Rnet}_t = \varpi_0 + \sum_{i=1}^{p} \beta_i \text{Rnet}_{t-i} + \sum_{i=1}^{q} \gamma_i X_{t-i} + \varepsilon_t$$

Where X_{t-i} represent all the components of banks' prudential regulations in misalignment that explain this dynamic model. Following the stationarity test by PESARA et al. 2001, considered one of the most effective tests in multivariate models, the model adapted for our data is the ARDL, as mentioned previously.

Variables of research

The data used in our study are annual and drawn from the databases of the Central Bank of Congo/BCC. These annual data cover the period from 2010 to 2022, spanning 13 years. The table below provides information on the variables used.

Model Variables	Nature in the Model	Description	Expected Outcomes
RNET	RNET	Net Income	+
FPB	FPB	Basic Equity	+
RSG	RSG	Overall Solvency Ratio	+
RLG	RLG	Overall Liquidity Ratio	–

Source: Reports of central bank of Congo; Key: "+" indicates a positive effect or relationship. "–" indicates a negative effect or relationship.

The data used in this article are derived from various documents, with the primary source being the website of the Central Bank of Congo. Other data are taken from annual reports, some from monetary policy documents, and others from the Central Bank of Congo's audit report known as "Deloitte," and additional data from the Central Bank of Congo's Financial Stability Report for the different years.

3. Results

Descriptive statistics will provide us with a range of tools to summarize, analyze, and interpret the data. In our study, below are the valuable insights into the distribution, central tendency, and dispersion of the variables as follows:

Variable	obs	Mean	Std.Dev	Min	Max
RNET	13	43.26538	34.68804	−2.8	89.6
FPB	13	426.7669	195.5807	130.12	758.88
RSG	13	23.14231	5.837314	13.05	0.30
RLG	13	126.0815	10.74761	117	158.86

Source: Author (our estimates using Stata 18).

Based on the previous table, it is noteworthy that all variables are generally volatile, as indicated by the standard deviation (std. Dev). The unit root of all variables, which are influenced by other explanatory variables such as basic equity, overall solvency ratio, and overall liquidity ratio of Congolese banks in the Democratic Republic of the Congo, will be more accurately checked by the Augmented Dickey-Fuller (ADF) stationarity test rather than the Andrews-Zivot test. This choice of the ADF test over the Andrews-Zivot is significant as it suggests a preference for a method better suited for handling properties like unit roots in time series data, which can impact the reliability of regression analysis if not properly addressed. The ADF test is commonly used to test for the presence of a unit root in a univariate time series sample, which helps to ensure that the data are stationary and thus suitable for further analysis.

It should be noted that we employed Stata 18 to analyze the stationarity of the series, conduct cointegration tests, causality tests, and perform estimations. This software is well-suited for econometric analyses and is user-friendly, allowing for various tests that were not available in previous versions of the software, such as bound cointegration tests and the Toda-Yamamoto causality tests, among others. Stata 18 enhances our analytical capabilities with its advanced features, which are particularly useful in handling complex time series data.

A non-stationary time series is characterized by changes in its mean and/or variance over time. If this non-stationarity (deterministic or stochastic) is not addressed (stationarized), it can lead to "spurious" regressions. It is worth noting that various tests are available to check whether a series is stationary or not (i.e., if it has a unit root): the Augmented Dickey-Fuller (ADF) test, the Phillips-Perron (PP) test, the Andrews-Zivot (AZ) test, the Ng-Perron test, KPSS, Ouliaris-Park-Perron, Eliott-Rothenberg-Stock, etc. Among all these tests, the first three are simple to use and commonly employed. In practice, the ADF test is effective when errors are autocorrelated, the PP test is appropriate in the presence of heteroskedasticity, and the AZ test is used for a series exhibiting a structural break or regime change identified endogenously. In this study, we utilized the ADF test, and the results are as follows (Table 1).

Net Income (RNET): With a p-value of 0.6667 at level, the series does not reject the null hypothesis of a unit root, indicating non-stationarity. However, the first difference yields a p-value of 0.0123 (See Table 2), suggesting stationarity after differencing, thus classified as I(1). Basic Equity (FPB): This series is similar to

RNET, showing non-stationarity at level with a p-value of 0.9229 and achieving stationarity after differencing (p-value of 0.0209), also classified as I(1). Overall Solvency Ratio (RSG): The p-value at level is extremely low (0.0001), indicating rejection of the null hypothesis of a unit root and confirming stationarity, hence classified as I(0). Overall Liquidity Ratio (RLG): Initially showing marginal non-stationarity at level (p-value of 0.0375), but stationary after the first difference with a p-value of 0.0000, thus classified as I(1). This Table 2 clarifies the stationarity status of each series, showing that except for the Overall Solvency Ratio, all other series require differencing to achieve stationarity. This information is crucial for further econometric modeling and analysis. Based on this table, it is evident that the net profit of Congolese banks in the Democratic Republic of the Congo remains constant over an extended period. This implies that net income does not vary significantly in one direction or another, but rather stays relatively stable around a specific value. The Central Bank of Congo has implemented a consistent and stable banking policy during the period from 2010 to 2022, while maintaining overall macroeconomic stability, as you can see, at a stable level. If the central bank adopts a predictable approach and does not radically alter its monetary policy, this could help maintain the stability of basic equity.

Table 1. Unit root tests for stationarity using adf at 5% significance level.

Variable	p-Value (Level)	p-Value (First Difference)	Stationarity Classification
Net Income (RNET)	0.6667	0.0123	I(1)
Basic Equity (FPB)	0.9229	0.0209	I(1)
Overall Solvency Ratio (RSG)	0.0001	-	I(0)
Overall Liquidity Ratio (RLG)	0.0375	0.0000	I(1)

Source: Author (our estimates using Stata 18).

Table 2. Pesaran test bounds.

Significance Level	Lower Bound	Upper Bound
1%	2.72	3.77
5%	3.23	4.35
10%	4.29	5.61

Source: Author (our estimates using Stata 18).

The Pesaran et al. cointegration test, commonly referred to as the Autoregressive Distributed Lag (ARDL) bounds testing approach. The Pesaran et al. cointegration test. The Pesaran cointegration test is a powerful method for testing cointegration in panel data, providing robust analysis of long-term relationships among variables observed across multiple entities and periods.

According to the results of the Pesaran test, the bounds cointegration test confirms the existence of a cointegration relationship (i.e., a long-term relationship) between the explanatory variables and the explained variable, such as basic equity, overall solvency ratio, and overall liquidity ratio. This is because the Snedecor F-test clearly exceeded all test bounds (the F-stat value is greater than the upper bound). This allows us to assess the long-term implications of basic equity, overall solvency ratio, and overall liquidity ratio, which are explanatory variables, as mentioned earlier. Additionally, we seek to examine the correlation and causality between these variables.

Study of correlation coefficients and multicollinearity test.

Test the simple correlation matrix among the following variables indicates a low correlation between the dependent variable (RNET) as a measure of financial capacity and the explanatory variables. The degree of association for most variables does not exceed 0.50 in the first column, except for a significant correlation with the net income of banks, where this coefficient is 0.8379, representing a determination degree of 83.79%, acknowledging that the coefficient of determination is the square of the correlation coefficient. Conversely, there may be some correlation between the overall solvency ratio (OSR) and the overall liquidity ratio (OLR), although this is not significant (Table 3).

Table 3. Correlation matrix with significance coefficients estimation of the adjusted model.

	RNET	FPB	RSG	RLG
RNET	1.0000			
FPB	0.8379 0.003	1.0000		
RSG	−0.2054 0.5008	−0.2065 0.4984	1.0000	
RLG	0.4110 0.1630	0.1562 0.6103	−0.3883 0.1899	1.0000

The Akaike Information Criterion (See Table 4) will be used to select the ideal ARDL model, which provides statistically significant results with the lowest parameters. The estimation results of the optimal ARDL model are presented in Table 4 below:

Table 4. ARDL (1, 1, 0, 0) regression.

D.RNET	Coef.	Std.Err.	t	p > |t|	[95% Conf.	Interval
ADJ						
RNET L1.	−1.202859	0.4673886	−2.57	0.042	−2.346517	−0.0592002

Continued

LR						
FPB	0.160496	0.0171479	9.36	0.000	0.1185365	0.2024554
RSG	1.186057	0.9571873	1.24	0.262	−1.156096	3.52821
RLG	0.888606	0.8828071	1.01	0.353	−1.271545	3.048757
SR						
FPB D1.	0.1706994	0.0611594	2.79	0.032	0.0210477	0.3203511
-cons	−211.6182	88.55119	−2.39	0.054	−428.2951	5.058795

Source: Author (our estimates using Stata 18).

Additionally, the following observations are noted. The aforementioned model provides us with estimations of long-term coefficients or elasticities.

4. Discussion of the Model Results

According to our model, there exists a long-term correlation between the net income of banks in the DRC and basic equity (See Table 5), which is due to several interdependent factors. Commercial banks frequently make investments in both short-term and long-term credits to generate profits. Their financial performance will therefore be impacted by the improvement of their basic equity, as well as the overall solvency ratio, while adhering to the macroeconomic prudential standards established by the Central Bank of Congo. In other words, according to our model, it is observed that there is a positive long-term correlation between net income and basic equity, the overall solvency ratio, and the overall liquidity ratio, while there is a short-term negative correlation between net income and basic equity.

According to the above model, the coefficient of adjustment or error correction term shows statistically significant significance, namely (−1.202859), which ensures an error correction mechanism and hence a long-term relationship (co-integration) between the variables (Sunzu, 2022a, 2022b, 2022c). This also implies that this system returns to equilibrium in the next period after experiencing a disequilibrium of 120.28%. Specifically, if a variable in this model is situated 1 unit above its long-term equilibrium level, it will decrease by approximately 1.202859 units per period until it reaches this equilibrium (Ciza & Sindayigaya, 2023; Mpabansi, 2023). Similarly, if its long-term equilibrium level is below 1 unit, it will increase by approximately 1.202859 units per period until reaching this equilibrium.

The net results generated by banks in the Democratic Republic of the Congo have a positive impact on their long-term performance and are rather more than proportional: an increase of one million dollars in basic equity in the DRC one year later results in an increase in net income volume of 0.160946 million dollars in the long term. $\frac{\partial Rnet}{\partial FPB} = 0.160946$

Furthermore, similar to the short-term results, basic equity has beneficial consequences on net income. A positive long-term relationship between basic equity and long-term net income is suggested by a positive coefficient, although the two variables are not strongly linked; this coefficient is economically weak in the specified model. An increase of one million in basic capital amount is thus associated with an increase in long-term net income of 0.1706994 million, and vice versa, demonstrating that the two variables exhibit a positive short-term relationship. Additionally, a positive long-term and short-term relationship between basic equity and net income is noted, although the coefficients are not highly significant (Jonya et al., 2023, 2024; Majerník, 2024; Mpabansi, 2023; Mperejimana & Sindayigaya, 2023). In an ARDL model, it is crucial to conduct tests for autocorrelation, heteroscedasticity, normality, and kurtosis to assess the model's fit to the data and verify if underlying statistical assumptions are met (Chateau, 2016; Majerník, 2024; Naranchimeg & Enkhamgalan, 2020; Skarzauskas, 2021). These tests help identify potential shortcomings in the model specifications or data, enhancing the reliability of econometric results obtained from the ARDL model. The null hypothesis implies that there is no error correlation in the series.

Tests assess various aspects of the model (See **Table 5**), including autocorrelation, heteroscedasticity, skewness, and kurtosis, to ensure the validity and reliability of the estimated results. All these tests accept the null hypothesis (Sindayigaya, 2024b). Therefore, our model is statistically validated. In most cases, the estimations of the ARDL model (1, 1, 0, 0) are satisfactory and explain 92.38% of the difference between net income and basic equity of banks in the DRC between 2010 and 2022. The Skewness test reveals very low information asymmetry (**Table 5**).

Table 5. Other model tests.

Hypothesis to Test	Hypothesis Test	Test Value	Probability
Autocorrelation	Breusch-Godfrey	0.182	0.6699
	Durbin-Watson	1.727188	$1 \leq DW \leq 3$
Heteroskedasticity	White's Test	12.00	0.3636
Skewness	White's Test	5.22	0.3901
Kurtosis	White's Test	0.13	0.7223

Source: Author (our estimates using Stata 18).

5. Conclusion

Congolese banks have a positive net income, demonstrating their good financial health and ability to generate profits, thereby enhancing investors' confidence in the long-term financial market of the DRC. By offering attractive return opportunities, banks with promising financial capacity can attract investors, thereby encouraging investment in the banking sector and promoting the country's economic development.

To achieve this objective, the establishment of policies that encourage a stable, predictable, and conducive business environment for banks can promote the growth of banking institutions and their ability to generate long-term profits. This includes streamlining administrative procedures, reducing excessive taxes, and safeguarding property rights. Equally important is the implementation of robust and effective regulations to oversee the banking market, preserve investor security, and ensure market transparency and reliability. This can foster investor confidence and mitigate risks associated with the system.

To enhance the financial capacity of Congolese banks, it is possible to strengthen financial education for investors and the general public, promote more informed and responsible participation, and reduce speculative behaviors.

By fostering economic growth, a moderate and stable solvency ratio can stimulate consumption and investment. According to this study, financial capacities can benefit from a thriving economy and potentially higher long-term returns. When a solvency ratio is moderate, investors have the opportunity to seek financial assets that offer returns suitable for this ratio. Generating positive real returns through financial securities can thus attract long-term investor interest.

In this regard, it is essential for banking authorities in the DRC to adopt prudent monetary policy to maintain a moderate and stable solvency level. In addition to implementing effective banking policy, it is crucial to promote overall macroeconomic stability. This requires preserving stability in basic equity, promoting a conducive business environment, strengthening financial regulation, and fostering transparency in the banking market. This includes creating financial products based on the solvency ratio or associated with other underlying assets.

Based on our study findings, a high level of basic equity can have a positive long-term impact on net income by improving market liquidity and facilitating transactions, thereby encouraging investments and long-term demand.

Following this study, it is evident that improving regulation and oversight of the banking market is essential to reduce risks and ensure its smooth operation. This may involve actions to restrict risky practices and strengthen requirements for basic equity for financial institutions. Increasing transparency in the interbank market can help reduce information disparities and enhance investor confidence. This may require regular updates of data regarding interbank exchanges and financial positions of institutions. In this study, banks in the DRC are encouraged to diversify their sources of funding outside the interbank market to reduce dependency and mitigate long-term adverse effects on debts. This includes the creation of stronger capital markets and support for non-banking institutions such as bond markets and investment funds.

Conflicts of Interest

We declare no conflicts of interest regarding the publication of this paper.

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