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The Effect of Non-Performing Loans on Credit Availability: Insight from the Moroccan Banking System.

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Abstract:

In recent years, Morocco has witnessed a notable and troubling increase in non-performing loans (NPLs). Data from Bank Al-Maghrib, the central bank of Morocco, reveals that non-performing loans accounted for over 8% of the total credit volume in 2022.

These loans present significant challenges, not only for the resilience of the banking sector but also because they can result in tighter credit conditions, making it increasingly difficult for businesses and consumers to obtain financing.

This study conducts a comprehensive analysis of the impact of non-performing loans on credit supply within the Moroccan banking system, covering the period from the first quarter of 2009 to the fourth quarter of 2022.

Findings from the ARDL model indicate that the rate of non-performing loans substantially impedes credit availability, both in the short term and the long term. This underscores the critical relationship between financial stability and economic stability.

Mots clés : Non-performing loans ; Credit supply ; Moroccan banking system ; ARDL

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Introduction

The banking system is an essential component of the economy, serving the critical function of mobilizing individual and institutional savings and allocating these funds as credit to the most productive uses, such as business investments and consumer loans. The stability of this system is vital, as it ensures the smooth functioning of financial transactions and contributes to overall economic stability (**Bernanke,2000**). A poignant example of the repercussions of banking instability is the financial crisis of 2007-2008, which revealed how the collapse of major financial institutions can lead to widespread economic turmoil, resulting in job losses, reduced consumer spending, and a prolonged recession (**Huang et al.,2023**).

One of the major challenges confronting the banking system is the prevalence of non-performing loans (NPL). A loan is classified as non-performing when the borrower has failed to make any scheduled payments or interest for more than 90 days (**Adriaan & Russel,2005**). This classification signifies a heightened risk of default. The accumulation of non-performing loans can pose a significant threat to the stability of financial institutions.

In recent years, Morocco has experienced a significant and concerning rise in non-performing loans (NPL). According to data from Bank Al-Maghrib, the central bank of Morocco, non-performing loans accounted for over 8% of the total credit volume in 2022.

Furthermore, **the International Monetary Fund (IMF)** expressed some concerns about this issue as early as 2018. These loans present particular challenges, as they can lead to a tightening of credit conditions, making it more difficult for businesses and consumers to access financing. Such limitations on credit availability can hinder economic growth, as businesses may struggle to invest and expand, while consumers may find it harder to finance major purchases.

Figure 1 provides a detailed illustration of the growing trend in non-performing loans (NPL), in absolute and relative terms. This upward trajectory in NPLs occurs concurrently with a noticeable slowdown in the overall growth of credit. The graphical representation helps to highlight the presumed relationship between the rising levels of NPLs and the decline in credit expansion, emphasizing potential concerns regarding the health of the financial system and the effectiveness of lending practices.

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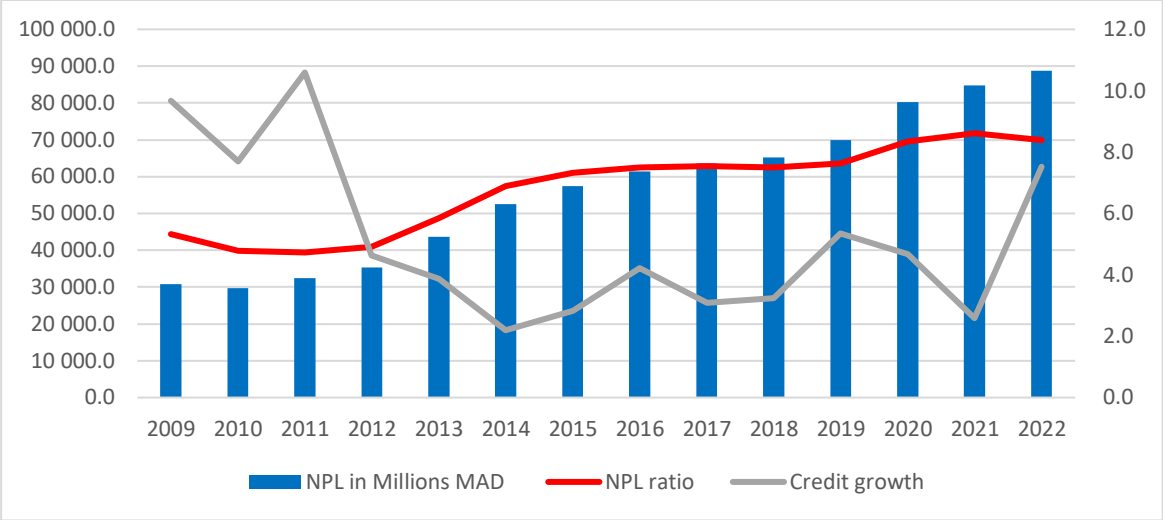

Source: Bank al Maghrib

Figure. 1 The evolution of non-performing loan (NPL) volume, NPL rate, and credit growth in Morocco from 2009 to 2022.

Several factors elucidate how non-performing loans influence credit supply, including heightened risk aversion and prioritization of asset quality improvement over the issuance of new loans (Huljak et al., 2022). These loans necessitate the creation of provisions, which consequently reduces the capital available for lending activities and negatively affects profitability.

An excessive accumulation of non-performing loans can result in inefficient resource allocation, allowing new credit to be allocated to struggling companies and sectors—often referred to as "zombie lending"—at the expense of emerging and more productive industries that require financing (see e.g. Balgova et al., 2016; Andrews and Petroulakis, 2017).

Finally, the rate of non-performing loans is a crucial indicator for predicting potential bank failures, as it reflects the degree of asset quality deterioration (Yurttadur et al.,2019). When the level of non-performing loans increases within a bank's portfolio, it leads to higher funding costs because lenders and investors perceive increased risk. This escalation in funding costs could restrict the bank's ability to supply loans to consumers and businesses (Serrano, 2021).

This study intends to thoroughly examine the extent to which non-performing loans affect the availability of credit in the Moroccan banking system. The importance of this research is twofold. First, it seeks to enhance and broaden the existing literature on the economic consequences of non-performing loans, a topic that has not received sufficient attention. By delving into the complex relationship between NPL and credit availability, this study aims to clarify how these loans can restrict financing options for both businesses and consumers,

thereby influencing overall economic development and prosperity. Second, this paper represents the first comprehensive analysis specifically centered on the Moroccan context. Through detailed insights and data-driven conclusions, this research will provide policymakers, financial institutions, and other stakeholders with essential information that can help them tackle the challenges posed by non-performing loans. The findings are expected to inform strategies aimed at improving credit supply, thereby promoting financial stability and supporting sustainable economic growth in Morocco.

The structure of this article is as follows: the first section reviews the existing literature on the topic, while Section 2 outlines the data, models, and methodologies utilized in this study. Section 3 presents an empirical analysis and interprets the results.

1. Literature review

Research examining the impact of non-performing loans (NPL) on the macroeconomic environment and credit supply is relatively scarce (**Serrano, 2021**). **Klein (2013)** identified that NPL significantly obstructed credit in Central, Eastern, and South-Eastern Europe (CESEE) during the period from 1998 to 2011.

In the context of Albania, **Shingjergji and Hyseni (2015)** employed OLS regression to analyze the banking sector's credit expansion between 2002 and 2013, concluding that NPL have an inverse effect on credit growth. Similarly, **Ivanović (2016)** explored the factors influencing credit growth in Montenegro, emphasizing that high levels of NPL diminish banks' lending capacity.

Accornero et al. (2017) conducted a borrower-level analysis of loans in Italy from 2008 to 2015 and found that NPL ratios do not significantly affect banks' lending behaviors. In a broader regional analysis, **Alihodžić and Ekşi (2018)** examined credit growth across Bosnia, Herzegovina, Croatia, and Serbia from 2007 to 2017, revealing a negative correlation between NPL rates and credit growth, which suggests increased risk aversion among banks.

Nguyen and Dang (2021) provided a comprehensive study of 27 Vietnamese banks from 2008 to 2018 and reported a significant negative relationship between NPL and credit growth, indicating that rising levels of NPL lead to declining credit expansion.

Huljak et al. (2022) utilized a panel Bayesian VAR model to investigate the effects of NPL ratios across twelve euro area countries. Their findings indicated that higher NPL ratios lead to decreased bank lending volumes, wider lending spreads, and a slowdown in real GDP growth.

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In Indonesia, **Rizkullah and Suhel (2023)** analyzed loan growth in seven commercial banks from 2017 to 2021 using the Generalized Method of Moments (GMM), concluding that NPL negatively impact credit growth. **Anwar et al. (2023)** further explored the factors influencing loans in Indonesian commercial banks from 2010 to 2022, revealing that while NPL have a positive effect on investment and working capital credits, they negatively impact consumption credit.

Lastly, **Amir and Choudhury (2023)** assessed the effects of NPL on lending practices in fifteen private Bangladeshi banks from 2012 to 2021, finding a significant negative correlation between NPL ratios and credit growth. Abdullah et al. (2024) added to this body of research by investigating the impact of NPL on bank lending within ASEAN nations from 2010 to 2022. Their findings, derived from the Generalized Method of Moments (GMM), indicated that increases in NPL and loan loss provisions correspond with reduced loan growth, highlighting a trend of increased caution in lending practices.

2. Data, model and methodology

2.1. Data

The data utilized in our analysis are secondary and were obtained from Bank Al-Maghrib and the High Commission for Planning (HCP). This analysis spans the period from the first quarter of 2009 through the fourth quarter of 2022.

Table 1 showcases the selected variables deemed relevant according to the existing literature, with all variables converted into their natural logarithmic form. Meanwhile, Table 2 provides a descriptive analysis of these variables, providing insights into their central tendencies, variability, and distribution characteristics.

Table 1. Variable

Variable nature	Variable	Acronym	Source
Dependent variable	Loans supply	LNCREDIT	Bank Al-Maghrib
Explanatory variables	The proportion of non-performing loans relative to total banking credits	LNNPLR	Bank Al-Maghrib
	The monetary policy rate: interbank interest rate	LNMMR	
	The real Gross Domestic Product (GDP)	LNRGDP	HCP
	The consumer price index	LNCPI	

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Table 2. Descriptive statistics

	LNCREDIT	LNNPLR	LNRGDP	LNCPI	LNMMR
Mean	27.38044	1.896966	26.14282	4.753739	0.899541
Median	27.38361	2.005885	26.15621	4.749271	0.900029
Maximum	27.66594	2.167132	26.32737	4.899526	1.205971
Minimum	26.99364	1.553550	25.87459	4.659658	0.405465
Std. Dev.	0.169117	0.207085	0.133796	0.053411	0.257265
Skewness	-0.363340	-0.397730	-0.332248	0.538224	-0.651449
Kurtosis	2.395648	1.546824	1.812827	3.198663	2.421584
Jarque-Bera	2.084381	6.403781	4.318849	2.795815	4.741583
Probability	0.352681	0.040685	0.115391	0.247114	0.093407
Sum	1533.305	106.2301	1463.998	266.2094	50.37430
Sum Sq. Dev.	1.573036	2.358633	0.984577	0.156898	3.640189
Observations	56	56	56	56	56

2.2. Methodology

This study aims to empirically investigate the effects of non-performing loans on the credit supply within the Moroccan banking system. We will employ the Autoregressive Distributed Lag (ARDL). Developed by Pesaran et al. (2001), this approach enables the investigation of both short-run and long-run interactions among variables. ARDL model estimates a regression that includes lagged values of the dependent variable (autoregressive terms) as well as lagged values of the independent variables (distributed lags). This structure allows the model to capture both the immediate effects of independent variables on the dependent variable and their delayed impacts over time. A key feature of the ARDL model is its capability to accommodate variables that are integrated at different orders, specifically I(0) and I(1). This means it can be effectively applied even when some variables are stationary while others are not.

Additionally, we will utilize the Fully Modified Ordinary Least Squares (FMOLS) method to confirm the robustness of the long-term effects estimated by the ARDL model. The Fully Modified Ordinary Least Squares (FMOLS) method is a statistical technique designed to provide consistent estimates of long-run relationships among cointegrated time series variables. Developed by Pedroni(2001) , FMOLS utilizes a residual-based approach to correct for potential biases that may arise in traditional ordinary least squares (OLS) estimation methods, particularly when dealing with non-stationary data. One of the primary advantages of FMOLS is its ability to yield reliable estimates even in situations where the sample size is relatively small(Ngoma & Yang, 2024). This is particularly important in empirical research, where data availability can be a limiting factor. Furthermore, FMOLS effectively addresses issues of endogeneity, a common problem in econometric analyses where explanatory variables are

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correlated with the error term. It also accounts for serial correlation in the residuals, which can lead to inefficient estimates if not properly addressed.

Our approach to estimating the ARDL model will follow this sequence:

1. First, we will assess the stationarity of the variable series under investigation through unit root tests.
2. Next, we will examine the cointegration among the relevant series.
3. Once we establish cointegration, we will proceed to estimate the coefficients that reflect both short-term and long-term relationships.

2.3. Model

The empirical model developed for estimation in this study is derived from an extensive review of both theoretical and empirical literature. It is expressed as follows:

LNCREDIT = f(LNNPLR, LNRGDP, LNCPI, LNMPR)

To analyze the relationships between these variables, the study employs the Autoregressive Distributed Lag (ARDL) model, as formalized by Pesaran et al. (2001). This model can be articulated in the following dynamic equation:

$$\Delta LNCREDIT_t = a_0 + \sum_{i=0}^{P} a_{1i}\ \Delta LLNCREDIT_{t-i} + \sum_{i=0}^{Q} a_{2i}\ \Delta LNNPLR_{t-i} + \sum_{i=0}^{Q} a_{3i}\ \Delta LNRGDP_{t-i} + \sum_{i=0}^{Q} a_{4i}\ \Delta LNCPI_{t-i} + \sum_{i=0}^{Q} a_{5i}\ \Delta ELNMMR_{t-i} + b_1 LNNPLR_{t-1} + b_2\, LNRGDP_{t-1} + b_3 LNCPI_{t-1} + b_4 LNMPR_{t-1} + e_t$$

In this equation:

- Δ represents the first difference operator, which captures changes from the previous period to the current period for each variable.
- a_0 is the intercept of the model, indicating the baseline level of credit when all other variables are held constant.
- The coefficients $a_1 \ldots a_5$ reflect the short-term impacts of changes in each corresponding variable on the change in credit.
- The coefficients $b_1 \ldots b_4$ signify the long-term relationships between the levels of non-performing loans, real GDP, the consumer price index, and the money market rate with credit, considering their lagged values.
- Finally, e_t denotes the error term, which is assumed to be white noise, reflecting random shocks or omitted variables that could affect credit dynamics.

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This model structure allows for a comprehensive examination of the short- and long-term effects on credit dynamics in relation to the identified economic indicators.

3. Results and discussion

3.1. Unit root tests

Table 3 provides a comprehensive overview of the unit root results for the time series analyzed at both their original levels and their first differences. The results obtained from the Augmented Dickey-Fuller (ADF) test indicate that all the variables under investigation are integrated of order one, which is denoted as I(1). This suggests that each series is non-stationary in its level form but becomes stationary when differenced once. In addition, the Phillips-Perron (PP) test, which serves as another method for testing the presence of unit roots, confirms that all examined variables also exhibit integration of order one, I(1). Having established that each variable is integrated of the same order, the next step in the analysis is to investigate potential long-run relationships among the variables.

Table 3. Unit root tests

Variables	ADF		PP		Integration order
	Level	1st difference	Level	1st difference	
LNCREDIT	-0.4214	-1.7229*	-2.2863	-13.2599***	I(1)
LNNPLR	1.0617	-1.7797*	-0.5587	-9.9174***	I(1)
LNRGDP	-1.4983	-8.3846***	-2.4060	-11.1787***	I(1)
LNCPI	0.8657	-2.8477***	1.6322	-11.1438***	I(1)
LNMMR	-1.5631	-3.6922***	-1.1880	-3.6021***	I(1)

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%.

3.2. Pesaran et al. (2001) cointegration test

To carry out this test effectively, we will proceed with the following two detailed steps:

1. We will identify the optimal lag length for our model by utilizing the Akaike Information Criterion (AIC). This statistical method helps in selecting the model that best balances goodness of fit and complexity, thereby minimizing the likelihood of overfitting.

2. Following the determination of the optimal lag, we will implement the Bounds test. This test is designed to evaluate the presence of cointegration between the time series variables under consideration. By doing so, we can ascertain whether a stable, long-term relationship exists among the variables, which is crucial for understanding their dynamic interactions.

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3.2.1. The optimal estimation lag of the ARDL model

Figure 2 clearly illustrates that the ARDL model (4,4,4,4,1) is the optimal choice among the top 20 models. It effectively utilizes less information and achieves the lowest Akaike Information Criterion (AIC), underscoring its efficiency and effectiveness. Selecting this model ensures a robust analysis with an excellent balance between simplicity and performance, making it the superior option for obtaining accurate and reliable results.

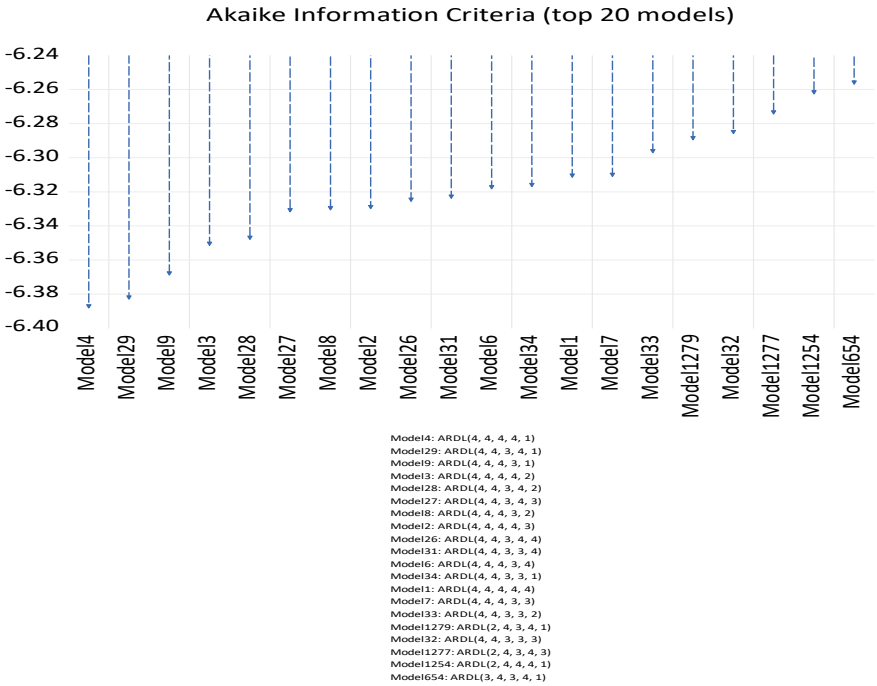

Figure 2. Selection from the twenty best models based on the AIC criterion.

3.2.2. Bound test

The F-statistic value has exceeded the upper bound at a 1% significance level, providing strong evidence of cointegration and indicating the existence of a long-term relationship between the series under analysis (Table 5). This cointegration suggests that the series move together over time, allowing us to investigate both the long-term equilibrium and short-term fluctuations between credit supply and the various explanatory variables.

Table 4. Bound test

Test Statistic	Value
F-statistic	12.14216

Signif.	I(0)	I(1)
10%	2.2	3.09
5%	2.56	3.49
1%	3.29	4.37

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3.3. Short-term and long-term effects

As detailed in Table 5, the adjustment coefficient plays a crucial role in facilitating convergence towards a long-term equilibrium. It is observed to be negative and statistically significant, residing between 0 and 1 in absolute value. This indicates that the error correction mechanism is effectively in place, allowing for the establishment of a long-term relationship among the variables under consideration.

Furthermore, Table 6 illustrates that a high rate of non-performing loans (NPL) poses a significant barrier to the availability of credit within the financial system. This issue impacts lending dynamics not only in the short term, where immediate access to credit may be restricted, but also has far-reaching negative effects that extend well into the long term. Specifically, elevated NPL rates create a disincentive for financial institutions to engage in lending activities, as they become more cautious and risk averse. This reluctance can lead to tighter credit conditions, making it more challenging for businesses and individuals to secure loans. Consequently, the ability of financial institutions to allocate credit effectively is constrained, which can hinder overall economic growth over time.

Regarding monetary policy, the monetary policy rate initially has a positive impact on credit supply in the short term. However, over the long term, this relationship shifts, resulting in negative effects. This shift can be attributed to the inherent delays in the transmission of monetary policy changes to the credit market. Specifically, it takes time for adjustments in the policy rate to filter through the economy.

Additionally, real GDP is noted to have a statistically significant negative impact on credit supply in the short term. This could imply that periods of economic contraction, reflected by declining GDP figures, adversely affect the confidence of lenders and borrowers alike, leading to reduced credit availability.

On the other hand, inflation does not appear to have a significant effect on credit supply in either the short run or the long run, suggesting that fluctuations in inflation rates do not play a substantial role in influencing the decisions made by financial institutions regarding credit allocation.

Table 5. Short-term and long-term effects

Short-term		
	Coefficient	Prob.
COINTEQ	-0.238724***	0.0000
D(LNCREDIT(-1))	-0.229288**	0.0252
D(LNNPLR)	-0.187994***	0.0011

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D(LNRGDP)	-0.189392***	0.0005
D(LNCPI)	0.241996	0.1062
D(LNMP_RATE)	0.062434***	0.0074
Long-term		
LNNPLR	-0.412880***	0.0010
LNRGDP	0.336331	0.3717
LNCPI	1.786386	0.1163
LNMPR	-0.339633***	0.0002
C	11.32800	0.0512

N.B.: (***) and (**) refer to 1% and 5% risk of error respectively.

3.4. Diagnostic tests

Table 6 provides a comprehensive overview of the results from the diagnostic tests conducted to evaluate the reliability and accuracy of the analysis. The diagnostic assessments indicate that the estimated model demonstrates no evidence of autocorrelation among the errors, which suggests that the residuals are independent over time.

Furthermore, there are no signs of heteroscedasticity, implying that the variance of the errors remains constant across different levels of the independent variables. The distribution of the errors is found to follow a normal distribution, which is a key assumption for many statistical models.

Moreover, the stability of the parameters within the Autoregressive Distributed Lag (ARDL) model is confirmed by the CUSUM test, which evaluates the cumulative sums of the residuals over time. The results of this test, illustrated in Figure 3, provide further assurance that the model's estimates are reliable and consistent throughout the sample period.

Table 6. Diagnostic tests

	Value	Prob
Serial Correlation: Breusch-Godfrey Serial Correlation LM Test	0.029808	0.9707
Heteroskedasticity: Breusch-Pagan-Godfrey	1.210332	0.3100
Normality: Jarque-Bera Test	0.292660	0.223951

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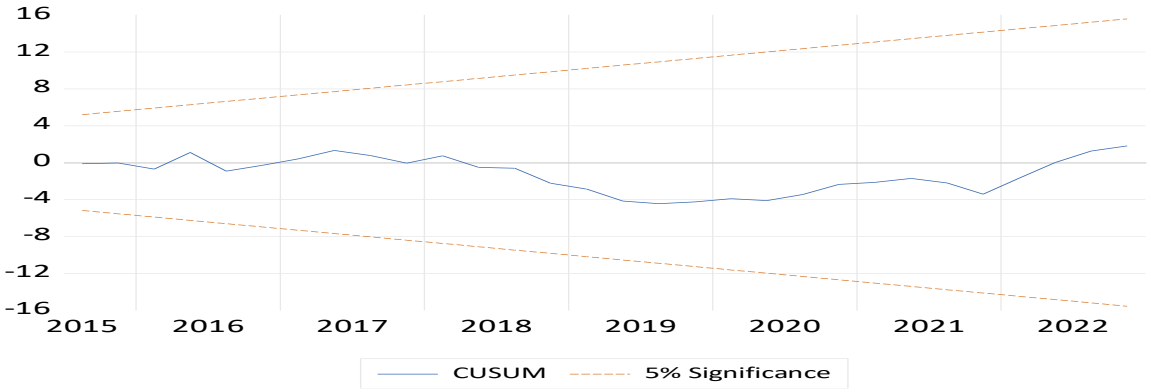

Figure 3. Stability test.

3.5. Robustness check

We used the FMOLS model to assess the robustness of the ARDL estimator, with the results presented in Table 7.

The findings from the FMOLS model reinforce the conclusions drawn from the ARDL estimation, particularly highlighting the negative impact of non-performing loans on the overall supply of credit. This suggests that as the volume of non-performing loans increases, banks may become more cautious, leading to a reduction in credit availability for consumers and businesses.

Furthermore, the FMOLS results corroborate the ARDL findings regarding the adverse effects of the monetary policy rate on credit supply. Specifically, a higher monetary policy rate tends to constrain credit availability, as borrowing costs increase, making it more expensive for individuals and firms to access loans.

In contrast, the FMOLS model reveals a positive relationship between economic growth and inflation with the supply of credit. This indicates that as the economy experiences growth, and when inflation rises, there is an increased availability of credit, likely due to enhanced borrower confidence and higher demand for loans to finance expansion activities.

Table 7. FMOLS results

Variable	Coefficient	Prob.
LNNPLR	-0.232117**	0.0112
LNRGDP	0.845784***	0.0000
LNCPI	1.263206***	0.0001
LNMPR	-0.129991**	0.0233
C	-0.179577	0.9536

R-squared	0.939062	
Adjusted R-squared	0.934187	

N.B.: (***) and (**) refer to 1% and 5% risk of error respectively.

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Conclusion

One of the critical challenges confronting the banking system is the prevalence of non-performing loans (NPL). The accumulation of these loans poses a significant threat to the stability of financial institutions and their ability to provide credit.

This study thoroughly examines the impact of non-performing loans on the credit supply within the Moroccan banking system. The results from the ARDL model clearly show that high rates of non-performing loans severely hinder credit availability, affecting both in the short-term and long-term . Elevated NPL rates create a substantial disincentive for lending, significantly limiting the capacity of financial institutions to allocate credit effectively.

Additionally, the findings from the FMOLS model support the conclusions drawn from the ARDL estimation, emphasizing the negative impact of non-performing loans on overall credit supply. As the volume of non-performing loans rises, banks tend to adopt a more cautious approach, leading to a marked reduction in credit access for both consumers and businesses.

This research delivers valuable insights and data-driven conclusions that provide policymakers, financial institutions, and other stakeholders with crucial information. The findings indicate that non-performing loans are not only a concern for banking stability but also pivotal to economic stability, given their substantial influence on economic financing. Addressing and reducing NPL bolsters banking stability and fosters sustainable economic growth in Morocco.

References

-Abdullah, W., Rahmati, S., Mohammad, A., Al-Hajj, N., & Khalaf, B. A. (2024). *Does Non-performing Loans Affect Bank Lending Behavior?.* In The AI Revolution: Driving Business Innovation and Research: Volume 2 (pp. 919-933). Cham: Springer Nature Switzerland.

-Accornero, M., Alessandri, P., Carpinelli, L., & Sorrentino, A. M. (2017). *Non-performing loans and the supply of bank credit: evidence from Italy*. Bank of Italy Occasional Paper, (374).

-Adriaan, M. B., & Russel, F. (2005). *The Treatment of Nonperforming Loans*. Retrieved from.

-Alihodžić, A., & Ekşï, İ. H. (2018). Credit growth and non-performing loans: evidence from Turkey and some Balkan countries. *Eastern Journal of European Studies*, 9(2).

-Amir, M. K. B. A., & Choudhury, N. N. (2023). The impact of non-performing loans on bank lending behavior before and amid COVID-19 Pandemic: Evidence from selected private commercial banks in Bangladesh. *International Journal of Research in Business and Social Science* (2147-4478), 12(3), 272-285.

-Andrews, D., Petroulakis, F.(2017). *Breaking the shackles: zombie firms, weak banks and depressed restructuring in Europe*. OECD Economics Department Working Papers, No. 1433. OECD Publishing, Paris Available at: https://doi.org/ doi: 10.1787/18151973 .

-Anwar, C. J., Suhendra, I., Didu, S., Sayektiyani, A., & Kholishoh, L. N. (2023). The impact of monetary policy and credit risk on bank credit behavior: An analysis of banks listed on the Indonesian stock exchange. *Cogent Economics & Finance*, 11(1), 2220250.

-Balgova, M., Nies, M., & Plekhanov, A. (2016). *The economic impact of reducing non-performing loans*.EBRD Working Paper.

-Bernanke, B. S. (2000). *2. Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression*. In Essays on the Great Depression (pp. 41-69). Princeton University Press.

-Huang, W., Molyneux, P., Ongena, S., & Xie, R. (2023). The new challenges of global banking and finance. *The European Journal of Finance*, 29(7), 693-699.

-Huljak, I., Martin, R., Moccero, D., & Pancaro, C. (2022). Do non-performing loans matter for bank lending and the business cycle in euro area countries?. *Journal of applied economics*, 25(1), 1050-1080.

-IMF *Country Report No. 18/58*

-Ivanović, M. (2016). Determinants of credit growth: The case of Montenegro. *Journal of Central Banking Theory and Practice*, 5(2), 101-118.

-Klein, N. (2013). *Non-performing loans in CESEE: Determinants and impact on macroeconomic performance*. International Monetary Fund.

-Ngoma, J. B., & Yang, L. (2024). Does economic performance matter for forest conversion in Congo Basin tropical forests? FMOLS-DOLS approaches. *Forest Policy and Economics*, 162, 103199.

-Nguyen, T. T., & Dang, T. V. (2021). Credit growth determinants—the case of vietnamese commercial banks. *Data Science for Financial Econometrics*, 567-582.

-Pedroni, P. (2001). *Fully modified OLS for heterogeneous cointegrated panels*. In Nonstationary panels, panel cointegration, and dynamic panels (pp. 93-130). Emerald Group Publishing Limited.

-Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.

-Rizkullah, A. R., & Suhel, S. A. (2023). Determinants of Credit Growth: An Empirical Study of Commercial Banks in Indonesia. *Journal of Applied Economic Research*, 22(2), 404-424.

-Serrano, A. S. (2021). The impact of non-performing loans on bank lending in Europe: An empirical analysis. *The North American Journal of Economics and Finance*, 55, 101312.

-Shingjergji, A., & Hyseni, M. (2015). The impact of macroeconomic and banking factors on credit growth in the Albanian banking system. *European Journal of Economics and Business Studies*, 1(2), 113-120.

-Yurttadur, M., Celiktas, E., & Celiktas, E. (2019). The place of non-performing loans in the Turkish banking sector. *Procedia Computer Science*, 158, 766-771.