The impact of liquidity crisis management on the profitability of the Algerian banking system during the Corona pandemic for the period (2018-2022)

أثر إدارة أزمة السيولة على ربحية الجهاز المصرفي الجزائري خلال جائحة كورونا للفترة (2018–2022)

Belghalem hamza [1], ilifi Mohamed [2]

[1] University Of Djilali Bounaama, Khemis Miliana (Algeria), h.belghalem@univ-dbkm.dz
[2] University Of Djilali Bounaama, Khemis Miliana (Algeria), m.ilifi@univ-dbkm.dz

Received: 18/04/2025 **Accepted:** 29/06/2025 **Published:** 30/06/2025

Abstract

answering the hypotheses presented in the research, we seek to focus on the role of the Bank of Algeria's measures in managing liquidity and maintaining bank profitability during the global crisis. health crisis,through a standard model that demonstrates this.

Based on panel models, we concluded that implementing precautionary policies based on capital and liquidity instruments, along with refinancing and mandatory reserves in accommodative monetary policy, helps Algerian banks expand their activities during crises, thus increasing their profitability.

Keywords: prudential policy; accommodative monetary policy ;liquidity crisis; control; Panel models
JELClassificationCodes: C21, C22, E52, E58

ملخص:

نهدف ضمن حيثيات هذه الدراسة إلى تبيان أثر إدارة أزمة السيولة على ربحية الجهاز المصرفي الجزائري خلال جائحة كورونا للفترة (2018–2022)، وذلك من خلال نموذج قياسي يبين ذلك.

وبالاعتماد على نماذج بانل توصلنا إلى أن تطبيق السياسات الاحترازية المرتكزة على أدوات رأس المال والسيولة، إلى جانبي أداة إعادة التمويل والاحتياطات الإجبارية في السياسة النقدية التيسرية تساعد على توسع نشاط المصارف الجزائرية أثناء فترة الأزمات وبالتالي زيادة ربحيتها.

كلمات مفتاحية: السياسة الإحترازية، السياسة النقدية التيسرية، أزمة السيولة، الرقابة الداخلية، نماذج بانل.

تصنيفات JEL: C21 ، C22، E52، E58 .

Corresponding author: hamza belghalem, h.belghalem@univ-dbkm.dz

The impact of liquidity crisis management on the profitability of the Algerian banking system during the Corona pandemic for the period (2018-2022)

INTRODUCTION:

Monetary policy has been primarily centered on controlling inflation as its fundamental objective in recent periods. However, with the emergence of new developments such as geopolitical fragmentation (globalization), climate change, an aging workforce, the rise of cryptocurrencies, and health crises, the challenges and core objectives of monetary policy have grown increasingly complex. These evolving circumstances necessitate the adaptation and refinement of the goals and instruments employed by central banks in their monetary policies.

The COVID-19 crisis, which swiftly escalated from a health emergency into an exceptional economic crisis due to lockdowns and quarantine measures, underscored several of these challenges. Central banks, in particular, faced the intricate interplay between monetary and financial stability, as well as the. Consequently, they adopted a dual objective approach to managing the crisis—stimulating economic activity while ensuring financial stability.

response this crisis, Bank of Algeria, alongside other central banks, endeavored to contain its repercussions on the financial and banking system, as well as on the Algerian economy, by assuming the role of financial intermediary. This was accomplished through the implementation of numerous measures affecting both monetary and prudential policies, aimed at alleviating the severity of the liquidity crisis at economic and social levels. Given this context, the pivotal research question guiding this study is as follows:

How have the prudential measures implemented How did the Bank of Algeria deal with the negative effects of the health crisis on the liquidity and profitability of commercial banks operating in the Algerian banking system?

Hypotheses:

- implementation of macroprudential policies, particularly exceptional liquidity management measures, has bolstered banking profitability within the Algerian financial system ;
- Expansionary monetary policy, through enhancing additional liquidity margins, has proven effective in improving its financial returns.;
- presence of an internal supervisory mechanism ensures banks' compliance with regulatory directives, thereby enhancing banking profitability within the Algerian financial system.

Research Objective:

This study aims to examine the impact of precautionary policies on reducing liquidity risks and their impact on improving the profitability of the banking sector.

Significance of the Study:

Its role is to encourage supervisory authorities to adopt strategies to achieve acceptable levels of banking profitability, particularly in light of the diverse and evolving risks facing the banking sector, with a particular focus on liquidity risks.

Methodology:

To conduct this research, a descriptive analytical approach will be used, using statistical indicators for inference and analysis. In addition, a standard model will be constructed through which we can test the hypotheses.

1- Prudential policy and the banking crisis

Macroprudential policy plays a crucial role in mitigating the adverse effects of crises affecting banking systems across different countries. Following the 2008 global financial crisis,

central banks have increasingly prioritized this policy to safeguard financial stability. To elaborate on this topic, the following aspects will:

1-1 Macroprudential Policy First

1-1- Definition of Macroprudential Policy

precautionary policy tools primarily employed to limit systemic risks, which refer to broad-scale disruptions in the provision of financial services due to either partial or total (younes & bouhanaali, 2023, p. 128), It is also described as a policy aimed at identifying, monitoring, and regulating systemic risks to prevent their accumulation and to enhance the financial system's resilience to shocks (Butour & Noufal, 2016, p. 42) .

Thus, macroprudential policy serves as a supervisory and regulatory framework that addresses the financial system as a whole rather than focusing on individual institutions. Its defining characteristic lies in its proactive and precautionary nature, as it is implemented by central banks to prevent disruptions in financial intermediation and to bolster the financial system's ability to withstand macroeconomic shocks. Additionally, this policy enhances the financial system’s sensitivity to risks and strengthens its capacity to absorb losses and disturbances (boubekeur, 2022, p. 25).

1-1- 2 Prudential policy objectives

According to numerous studies, prudential policy is divided into two types: intermediate and ultimate objectives. The overall objective is to ensure financial stability, while the intermediate objectives, which are interconnected and contribute to achieving the ultimate objective, can be summarized as follows (younes & bouhanaali, 2023, p. 128):

-Resilience of the system to macroeconomic shocks by creating and activating precautionary reserves that enable the system to operate effectively;

-Reducing systemic risk over time by mitigating cyclical interactions;

-Controlling structural weaknesses within the financial system exposures and the critical role of key intermediaries in major markets, which may lead to institutions becoming "too big to fail."

1-1- 3 Instruments of Macroprudential Policy

Macro-prudential tools are designed to directly mitigate banks' risks. The main measures in macro-prudential policy focus on the following areas (Vollmer, 2021, p. 1513), (Merbet & Benziane, 2024, pp. 124-125) :

- Capital Requirements: This indicator assesses banks' ability to absorb unexpected losses.

-Liquidity Regulations**:** These measures help identify risks stemming from maturity mismatches.

-Credit Regulations**:** These instruments aim to detect vulnerabilities in banks’ lending policies.

1-2 Banking Crises

1-2-1 Definition of Banking Crises

crisis is characterized by financial situation in key performance indicators deteriorate (Chtourou & Hammami, 2016, p. 2), particularly a decline in liquidity levels. This occurs when a bank is unable to meet its agreed-upon current or future obligations, leading to a surge in deposit withdrawals—either at an individual bank level or across the banking system. Banking crises can be categorized as follows (ziane & djamaa, 2020, p. 543):

-Liquidity Crisis: Also referred to as technical insolvency, this type of crisis arises when a bank is unable to meet its short-term obligations, despite possessing assets that exceed its liabilities.

This situation often results from a mismatch between asset maturities and liabilities (rayhan, 2005, p. 114).

-Solvency Crisis: Also known as true financial distress, this crisis occurs when a bank is completely incapable of meeting its obligations, leading to its financial collapse.

1-2-2 Causes of Banking Crises

Several factors contribute to the emergence of banking crises, including (Khelif & Madoukh, 2022, pp. 743-744)

A. Managerial Causes: Poor management practices often lead to banking crisesAmong the reasons we find:

- Lack of overall supervision, particularly in cost control;
- A mismatch between the organizational structure and employees' operational needs.
- Manipulation or embellishment of financial statements.

B. Technical Causes: These include:

- Excessive expansion in credit issuance based on unsound lending practices.

An oversupply of liquidity due to the substantial volume of deposits, encouraging banks to grant excessive loans and credit facilities;

- Intensified competition among banks;

-Excessive authority granted to branch managers;

-The absence of proper feasibility studies accompanying credit issuance, leading to non-compliance with lending regulations.

C. Financial Liberalization: The deregulation of interest rates may expose banks to increased risks, as they lose the protective mechanisms previously established by monetary, regulatory, and legislative authorities. Furthermore, the entry of new competitors heightens pressure on banks, compelling them to engage in riskier financial activities unless regulatory frameworks are strengthened before financial liberalization.

D. Weak Financial Discipline: A lack of financial discipline is one of the primary drivers of financial and banking crises, particularly when asymmetric information exists between parties. In such cases, trust deteriorates between lenders and borrowers, resulting in an environment of uncertainty. This leads to information asymmetry, where one party possesses more information than the other, impairing accurate risk assessment and fostering poor decision-making. Consequently, moral hazard increases, and the phenomenon of free-riding emerges, where informed individuals cannot prevent others from benefiting from their insights.

1-3 Liquidity Crisis Management Amid the COVID-19 Pandemic

The primary objective of macroprudential policy, which is to ensure financial stability, is significantly influenced by monetary policy goals. A lack of coordination between these two policies can have adverse effects on financial stability, particularly when central banks impose low interest rates in periods of low inflation (Arab Monetary Fund report, 2020, p. 15) A study conducted (Fazio, Tabak, Silva, & Cajueiro, 2018, pp. 1-15) found that misalignment between these policy objectives leads to heightened financial crises. Furthermore, the excessive focus of monetary policy on achieving low inflation rates was among the key drivers of the 2008, In addition to studying (ALIN MARIUS & MELNIC, 2019, p. 96) indicated that when interest rates reach the zero lower bound, their impact on financial and macroeconomic variables

becomes limited. In such scenarios, macroprudential policy serves as a complementary instrument to monetary policy in fostering both macroeconomic and financial stability.

Liquidity-targeting macroprudential tools are employed less frequently than capital-focused measures, primarily because microprudential instruments already include sufficient mechanisms to address liquidity concerns. Nevertheless, several macroprudential tools are designed to enhance financial stability and influence economic activity, including the Liquidity Coverage, countercyclical capital buffers, and statutory reserve requirements. To mitigate credit cycles, liquidity-focused macroprudential instruments enable banks to adjust their financial positions—both assets and liabilities—by employing one or more of the following strategies (Arab Monetary Fund report, 2020, p. 15) :

-Relying on long-term financing instead of short-term funding;

- Preferring secured financing over unsecured borrowing;

- Holding a higher proportion of liquid assets rather than illiquid ones.

Monetary policy influences financial soundness and stability through the risk-taking channel (Claudio & Haibin, 2012, p. 236), Expansionary monetary policy, characterized by lower interest rates, increases banks' demand for assets, leading to asset price inflation, balance sheet expansion, and higher leverage. Consequently, this fosters the emergence of the risk-taking channel in monetary policy (Abbate & Dominik, 2023, p. 2); (BonÖm & Soares, 2018, p. 1510). This phenomenon is largely driven by the pursuit of higher financial returns on capital, particularly during economic booms (Elsayed, Naifar, & Nasreen, 2023, p. 397). However, such behavior often results in the accumulation of non-performing loans, ultimately undermining financial stability. Conversely, when interest rates rise, risk-taking behavior tends to subside (Claudio, Gabriel, & José Américo, 2016, p. 178).

There are two primary mechanisms through which monetary policy affects financial stability via the risk-taking channel in environments of low interest rates, which encourage banks to assume greater risks (Claudio, Gabriel, & José Américo, 2016, p. 178):

-The impact of low interest rates on risk assessment and borrowers' repayment capacity, subsequently influencing banks' risk measurement approaches;

-The decline in returns on various types of investments, including risk-free government securities, which incentivizes banks to invest in riskier assets (for behavioral, contractual, and institutional reasons) to secure higher future yields in exchange for assuming greater risk (Yiping, Xiang, & Wang, 2021, p. 1).

expansionary monetary policy (non-restrictive stance), banks tend to extend more credit, reinforcing the procyclical nature of the banking system. This expansion in credit increases banks' risk exposure, thereby reducing expected losses and loan provisions (Caldas Montes & Tavares Pe, 2014, pp. 82-94). However, such a trend adversely affects capital adequacy ratios, as it impacts bank capital more significantly than risk-weighted assets. Consequently, financial stability deteriorates (Claudio, Gabriel, & José Américo, 2016, pp. 178-179). Given this dynamic, capital adequacy requirements within macroprudential policy serve as a complementary measure to mitigate excessive credit expansion and risk accumulation (Fabiani, López Piñeros, & José, 2022, pp. 1-32). Thus, financial stability tools—such as the capital requirements set by the Basel Committee on Banking Supervision—can serve as viable alternatives to interest rates in influencing credit volumes in the banking sector (Cecchettia & Kohler, 2014, pp. 205-231).

In response to the financial repercussions of the COVID-19 crisis, supervisory authorities implemented a range of measures to alleviate liquidity pressures and support economic recovery. While some measures aimed at injecting liquidity into the economy to counteract financial distress, (Arab Monetary Fund report, 2020, p. 15):

-Deferral of loan installment payments;

-Introduction of economic stimulus programs and financing schemes targeting the most affected sectors, featuring low interest rates and relaxed lending conditions;

-Reduction in interest rates on credit facilities;

-Waivers on selected fees and commissions;

-Increases in credit card limits and daily withdrawal and deposit thresholds;

-Reduction in mandatory reserve requirements;

2- Performance of the Algerian banking system under prudential regulation

2-1 Method

To properly analyze the content of the research, we must determine the method used as follows:

2-1-2 Study sample

To achieve the study's objective, we relied on a purposive sample, which included all public banks and eight private banks. The remaining banks that comprised the sample were excluded due to a lack of relevant data during the study period on the variables to be studied.

2-1-2 Defining variables

The model variables can be summarized in the following table:

Table (1): Standard study variables.

symbol	Indicator	Index categor	Interpretation
dependent variable			
y	Net Result / Total Assets	Profitability	This indicator describes the overall occurrence of a banking crisis by explaining the bank's inability to achieve an economic return or a cash surplus that is not sufficient to meet short-term obligations and cover external sources of funds.
Independent variables			
x_1	Equity/Total Risk-Weighted Assets	Macro-prudential policy objective	This approach falls within the framework of comprehensive prudential policy indicators aimed at ensuring financial stability at the to the accumulation of shocks. This is in line with the monetary policy objective, which now includes the objective of achieving financial stability, as stipulated in Article 35 of Law No. 23-09 of June 2023, which includes the Monetary and Banking Code.

x_2	The goal of accommodative monetary policy	Cash on hand / Total assets	Accommodative monetary policy frees up additional liquidity for banks to help them meet their financial obligations at times.
x_3	Average income for the previous three years*12.5%	Internal control of banks	Internal control in banks enables their management to adhere to the procedures and measures issued by the supervisory authority related to macro-prudential and monetary facilitation policies, which leads to reducing the amount of losses resulting from banking operations.

Source: Based on the outputs stata .15

2-2 Presentation and analysis of results

In this context, we seek, through the economic measurement methodology, to estimate and analyze as follows:

2-2-3 Comparing Panel Models

this section, we will determine the preference for panel models using the statistical program Stata 15. The results of this program are as follows:

this section, we will evaluate the three panel models, then choose which one is best.

Table (2): Panel model estimation output results.

explanatory variables	pooled model	Fixed effects model	Random effects model
X1	0.1042656 (0.000)	0.0248721 (0.35)	0.0968516 (0.000)
X2	0.0216918 (0.002)	-0.0082542 (0.631)	0.0187659 (0.019)
X3	-0.0117264 (0.035)	-0.0103839 (0.291)	-0.0105088 (0.091)
constant	0.0042713 (0.105)	0.0181269 (0.002)	0.0051707 (0.090)
Number of obs	70	70	70
R-squared	0.6214	0.7692	-
Adj R-squared	0.6024	0.6995	-
Prob > F	0.0000	0.4158	0.0000

Source: Based on the outputs stata .15

After estimation, we apply the necessary statistical tests.

- Breusch Pagan test: or absence of random effects. We used the same statistical program mentioned above, and obtained the results recorded in the following table:

Table (3): Breusch and Pagan test

chibar2(01)	0.19
Prob > chibar2	0.3332

Source: Based on the outputs stata .15

Since the probability value is greater than 5%, we accept the hypothesis that there are no random effects. In other words, the cumulative effects model is better.

- Hausman test:

$$\begin{cases} H_0 : \text{Random effects model} \\ H_1 : \quad \text{Fixed effects model} \end{cases}$$

The results of the test based on the (stata.15) program are shown in the following table:

Table (4): Hausman test

chi2(3)	15.82
Prob>chi2	0.0012

Source: Based on the outputs stata .15

By extrapolating the results of the table, we find that the fixed effects model is the best.

- Fisher's test:

$$\begin{cases} H_0 : \text{pooled model} \\ H_1 : \quad \text{Fixed effects model} \end{cases}$$

Table (5): Fisher's test.

F(13, 53)	2.61
Prob> F	0.007

Source: Based on the outputs stata .15

From the table results, we can see that the probability value of the performed test is (Prob> F=0.007<0.05), which leads us fixed **model** .

2.2.3. The ideal model

The optimal model among the three models is the fixed effects model, so the estimated model must first include be examined to ensure it is free of econometric problems. Here, we use the following diagnostic tests:

Wooldridge Test: One of the most significant estimation problems facing experts and researchers autocorrelation. the most prominent tests used to confirm the presence of autocorrelation of errors. (Jalali Toumi, 2018, p. 239), This test can be performed through the program (stata .15) via the command (xtserial.) and its results gave the following:

```
xtserial y x1 x2 x3
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,  13) =     34.619
           Prob > F =      0.0001
```

We find that the value F (1, 13) = 34.619] is greater than the table value with a probability of less than 1%, This leads us to accept the alternative hypothesis.

Modified test: This test seeks to check for the presence of heteroscedasticity, which may negatively affect the efficiency and accuracy of variance estimates used by model estimators. To monitor this issue, the adjusted Wald test for heteroscedasticity in fixed-effects models is used, using the (xttest3) command in Stata 15, as shown in the following application results.

```
xttest3
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (14)  =     368.93
Prob>chi2 =      0.0000
```

The results of this test allowed us to confirm that the fixed effects model suffers from a homoscedasticity problem.

2-3-4 analysis of results

There is no doubt that the existence of economic measurement problems leads to an inaccurate relationship between the economic variables under study. Therefore, must get rid of

these standard problems to continue building the optimal standard model. In the field of cross-sectional time series, we use the correction method through the (xtpcse) instruction in the program (Danie, 2007, p. 285) Where cross-sectional data is larger than intervals using these instructions in Stata15 yields the following results:

```
xtpcse y x1 x2 x3
Linear regression, correlated panels corrected standard errors (PCSEs)
Group variable:   ind                          Number of obs     =         70
Time variable:    year                         Number of groups  =         14
Panels:           correlated (balanced)        Obs per group:
Autocorrelation:  no autocorrelation                           min =          5
                                                               avg =          5
                                                               max =          5
Estimated covariances      =        105        R-squared         =     0.6214
Estimated autocorrelations =          0        Wald chi2(3)      =      73.79
Estimated coefficients     =          4        Prob > chi2       =     0.0000

------------------------------------------------------------------------------
             |           Panel-corrected
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .1042656   .0158346     6.58   0.000     .0732303    .1353009
          x2 |   .0216918   .0090759     2.39   0.017     .0039034    .0394801
          x3 |  -.0117264   .0038125    -3.08   0.002    -.0191987    -.004254
       _cons |   .0042713   .0020487     2.08   0.037     .0002559    .0082867
------------------------------------------------------------------------------
```

Source : Based on the outputs stata .15

4 - Analysis and discussion of results:

After addressing the problems of autocorrelation of errors and heteroscedasticity, and based on most of the previous statistical tests, the optimal model:

$$y = 0.004271 + 0.1042656x_1 + 0.0216918x_2 - 0.0117264x_3$$

-The results of the equation indicate the acceptance of the first hypothesis. Accordingly, the application of the Bank of Algeria's precautionary policies, represented by increasing capital adequacy by one unit, leads to improving profitability. by 0.104 units. This effect is attributed to the exceptional measures undertaken by the Bank of Algeria to relax certain prudential requirements imposed on banks and financial institutions under Instruction No. 05-2020, dated April 6, 2020. mandatory capital buffer requirement, allowing them to defer or reschedule loan repayments clients benefiting from deferrals or rescheduling, and postponing the deadline for raising the minimum capital requirement for banks and financial institutions from December 31, 2020, to June 30, 2021. During the global health crisis, these measures enabled Algerian banks to resume operations and moderately increase their profits, ultimately strengthening their capital adequacy beyond the regulatory minimum threshold. By the end of 2021, the banking sector recorded a notable improvement in its overall solvency ratio, which rose to 21.82% from 19.17% at the end of 2020. This enhancement was primarily driven by an improvement in the solvency of public banks, resulting from a 7.3% reduction in risk-weighted assets (reflecting the diminished impact of the health crisis), which contributed +1.51 percentage points to the overall solvency ratio. Additionally, a 5.5% increase in regulatory capital added 1.06 percentage points to the change in the same ratio. Collectively, these changes produced a positive net effect of 2.65 percentage points, underscoring the ability of Algerian banks, through exceptional

prudential measures, to bolster their profitability and absorb potential losses without compromising their solvency during periods of financial distress.

results confirm the second hypothesis

- regression equation results also validate the second hypothesis adoption of an accommodative monetary policy characterized by the provision of additional liquidity buffers enhances banking profitability in Algeria. Specifically, a one-unit increase in the liquidity ratio within Algerian commercial banks leads to a rise of 0.021 units in profitability. This outcome supports the objective of the Bank of Algeria's expansionary monetary policy, aimed at stimulating economic Measures to implement the specialized refinancing program include (one-year temporary liquidity injection operations, renewable twice at a benchmark interest rate) The reduction provides additional liquidity to banks., of which DZD 508.78 billion directly contributed to increasing liquidity levels in banks. Moreover, the sector's liquid assets, which cover short-term obligations, surged to 101.7% in December 2021, compared to 37.1% in December 2020—an increase largely driven by a 230.6% rise in liquid assets between 2020 and 2021.

-The regression analysis further confirms the acceptance of the third hypothesis, which asserts that the presence of an internal control mechanism compels bank management to adhere to supervisory authority directives, thereby enhancing banking profitability within the Algerian financial system. Specifically, a one-unit reduction in operational risk, attributable to the existence of an internal control framework, leads to an improvement in banking profitability. According to Article 108 of Law No. 93-09, dated July 21, 2023, governing the banking sector, Violations of minimum liquidity ratio requirements and risk concentration limits accounted for 17% and 41%, respectively, of total prudential control violations in 2020 (Bank of Algeria, 2021, p. 118). This observation highlights, in general, the effectiveness of internal control systems in obligating Algerian banks to comply with supervisory authorities' guidelines.

Conclusion:

The standard study led to several main results, which can be referred to as follows: findings, both theoretically and empirically:

-Macroprudential and monetary policies play a crucial role in ensuring financial stability.

- methods adopted by the Bank of Algeria have enhanced banks' ability to mitigate crises and mitigate the negative effects of the pandemic, enabling them to continue operations during the crisis.

- By reducing systemic risks and preventing liquidity crises in the Algerian banking sector, macroprudential measures helped lower financial costs associated with market volatility during the pandemic.
- Capital-based precautionary tools contributed to improved profitability.
- The monetary policy pursued in Algeria has led to increased liquidity levels within the banking sector, enhancing profitability during the crisis. - Internal control mechanisms have effectively achieved their objectives and positively impacted banking profitability.

Despite the positive integration of macro-prudential policies in liquidity management crisis, it is imperative to formulate recommendations addressing post-pandemic economic

challenges, particularly those arising from inflationary pressures. These recommendations include:

crisis, it is imperative to formulate recommendations addressing post-pandemic economic challenges, particularly those arising from inflationary pressures. These recommendations include:

-Designing a monetary policy framework that accounts for inflationary risks associated with post-pandemic economic recovery while minimizing adverse effects on economic activity.

-Developing mechanisms to mitigate the risks of supply chain disruptions resulting from increased commercial incentives, which could expose the Algerian economy to further supply-side fluctuations.

-Accelerating the adaptation of the Algerian banking sector to updated prudential regulations - issued by the Basel Committee on Banking Supervision.

Bibliography List:

Abbate, A., & Dominik, T. (2023). Optimal monetary policy with the risk-taking channel. *European Economic Review , Vol 152*, 1-12.

ALIN MARIUS, A., & MELNIC, F. (2019). Macroprudential Policies And Economic Growth. *Journal of Review of Economic and Business Studies , Vol 12* (N 1).

Arab Monetary Fund report. (2020). *The relationship between macroprudential policy and other economic policies.*

BonÖm, D., & Soares, C. (2018). The risk-taking channel of monetary policy - exploring all avenues. *Journal of mony, credit and banking , Vol 50* (N 7), 1507-1571.

boubekeur, M. (2022). The impact of coordination between monetary policy and macroprudential policies on achieving monetary and financial stability. *Forum for economic studies and research journal* , 25.

Butour, F., & Noufal, S. (2016). Evaluation of the Bank of Algeria's macroprudential policy to hedge against banking crises: an analytical study for the period (2003-2013). *Recherchers economiques manageriales , Vol 10* (N 1), 42.

Caldas Montes, G., & Tavares Pe, G. B. (2014). Risk-taking channel, bank lending channel and the “paradox of credibility”: Evidence from Brazil. *Economic Modelling , Vo 39*, 82-94.

Cecchettia, S. G., & Kohler, M. (2014). When Capital Adequacy and Interest Rate Policy Are Substitutes (And When They Are Not). *International Journal of Central Banking , Vol 10* (N 3), 205-231.

Chtourou, H., & Hammami, S. (2016). La Révolution Tunisienne et ses Effets sur le Système Bancaire Tunisien. *International Journal Economics & Strategic Management of Business Process* .

Claudio, B., & Haibin, Z. (2012). Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism? *Journal of Financial Stability , Vol 8* (N 4), 236-251.

Claudio, O. d., Gabriel, C. M., & José Américo, P. A. (2016). How does capital regulation react to monetary policy? New evidence on the risk-taking channel. *Economic Modelling , Vol 56*, 177-186.

Danie, H. T. (2007). Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence. *he Stata Journal* (Number 3), 285.

Elsayed, A. H., Naifar, N., & Nasreen, S. (2023). Monetary Policy Reaction:Evidence From The GCC Contries. *The Quarterly Review of Economics and Finance , Vol 87*, 396-405.

Fabiani, A., López Piñeros, M., & José, L. (2022). Capital controls, domestic macroprudential policy and the bank lending channel of monetary policy. *Vol 139*, 1-32.

Fazio, D. M., Tabak, B. M., Silva, T. C., & Cajueiro, D. O. (2018). Inflation targeting and financial stability: Does the quality of institutions matter? *Economic Modelling , Vol 71*.

Jalali Toumi, H. (2018). Testing the impact of some factors on the capital structure of Algerian private banks - an applied study during the period (2009-2014). *New Economics Magazine , vol 19* (n 2).

Khelif, A. R., & Madoukh, M. (2022). The role of the deposit guarantee system in banking crises management Case study of the Palestinian Deposit Insurance Corporation. *Revue Des Sciences Humaines , Voe 33* (N 3).

Merbet, M., & Benziane, R. (2024). The relationship of macro-prudentail policy and fiscal policy in algeria An analytical study for the period (2009-2021). *Journal Of Contemporary Economic Studies , Vo 9* (N 1).

rayhan, a. (2005). Financial distress: stages, causes, methods, and treatment procedures. *El-Tawassol , Vol 11* (N 2).

Vollmer, U. (2021). Monetary policy or macroprudential policies:What can tame the cycles? *Journal of Economic Surveys , Vol 36* (N 5).

Yiping, H., Xiang, L., & Wang, C. (2021). Whatdoespeer-to-peerlendingevidencesay about the Risk-Taking Channel of monetarypolicy?,, vol 66,2021. *Journal of Corporate Finance , vol 66*, 1-35.

younes, K., & bouhanaali, a. (2023). Macroprudential policy efficiency in anticipating the Algerian banking sector fragility -Analytical study of the period form 2010 to 2020. *Revue des Economies financières bancaires et de management , Vol 12* (N 2), 128.

ziane, a., & djamaa, m. (2020). Financial Liberalization and the Transmission of Banking Crises the case of Algeria. *ournal of business and finance economy , Vol 5* (N 2), 543.

-Appendices

Appendix 1: Estimate of the three panel models

- Pooled Regression Model

```
reg y x1 x2 x3
```

```
      Source |       SS           df       MS      Number of obs   =        70
-------------+----------------------------------   F(3, 66)        =     36.11
       Model |  .003106586         3  .001035529   Prob > F        =    0.0000
    Residual |  .001892835        66  .000028679   R-squared       =    0.6214
-------------+----------------------------------   Adj R-squared   =    0.6042
       Total |  .004999421        69  .000072455   Root MSE        =     .00536

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .1042656   .0104781     9.95   0.000     .0833454    .1251858
          x2 |   .0216918   .0066916     3.24   0.002     .0083316     .035052
          x3 |  -.0117264   .0054575    -2.15   0.035    -.0226227   -.0008301
       _cons |   .0042713   .0026017     1.64   0.105    -.0009233    .0094658
------------------------------------------------------------------------------
```

- Fixed Effects Model

```
xtreg y x1 x2 x3 , fe
```

```
Fixed-effects (within) regression               Number of obs      =        70
Group variable: ind                             Number of groups   =        14

R-sq:                                           Obs per group:
     within  = 0.0518                                         min =         5
     between = 0.3406                                         avg =       5.0
     overall = 0.2477                                         max =         5

                                                F(3,53)            =      0.97
corr(u_i, Xb)  = 0.3481                         Prob > F           =    0.4158

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .0248721   .0264019     0.94   0.350    -.0280833    .0778276
          x2 |  -.0082542   .0170906    -0.48   0.631    -.0425336    .0260252
          x3 |  -.0103839   .0097452    -1.07   0.291    -.0299304    .0091626
       _cons |   .0181269    .005516     3.29   0.002     .0070631    .0291906
-------------+----------------------------------------------------------------
     sigma_u |  .00675602
     sigma_e |  .00466615
         rho |  .67703988   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(13, 53) = 2.61                     Prob > F = 0.0070
```

```
. areg y x1 x2 x3 , absorb ( banque )
```

```
Linear regression, absorbing indicators         Number of obs      =        70
                                                F(   3,     53)    =      0.97
                                                Prob > F           =    0.4158
                                                R-squared          =    0.7692
                                                Adj R-squared      =    0.6995
                                                Root MSE           =    0.0047

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .0248721   .0264019     0.94   0.350    -.0280833    .0778276
          x2 |  -.0082542   .0170906    -0.48   0.631    -.0425336    .0260252
          x3 |  -.0103839   .0097452    -1.07   0.291    -.0299304    .0091626
       _cons |   .0181269    .005516     3.29   0.002     .0070631    .0291906
-------------+----------------------------------------------------------------
      banque |         F(13, 53) =      2.610   0.007          (14 categories)
```

- Random Effects Model

```
xtreg y x1 x2 x3 , re
Random-effects GLS regression                   Number of obs     =         70
Group variable: ind                             Number of groups  =         14

R-sq:                                           Obs per group:
     within  = 0.0252                                         min =          5
     between = 0.8967                                         avg =        5.0
     overall = 0.6211                                         max =          5

                                                Wald chi2(3)      =      66.05
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |   .0968516   .0124132     7.80   0.000     .0725222    .1211809
          x2 |   .0187659   .0079934     2.35   0.019     .0030991    .0344326
          x3 |  -.0105088   .0062082    -1.69   0.091    -.0226767    .0016592
       _cons |   .0051707    .003053     1.69   0.090    -.0008129    .0111544
-------------+----------------------------------------------------------------
     sigma_u |  .00179281
     sigma_e |  .00466615
         rho |  .12863334   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix 2: Trade-off between a Pooled Regression Model and a Random Effects Model

```
xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

       y[ind,t] = Xb + u[ind] + e[ind,t]

       Estimated results:
                        |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                      y |   .0000725       .0085121
                      e |   .0000218       .0046661
                      u |   3.21e-06       .0017928

       Test:   Var(u) = 0
                           chibar2(01) =     0.19
                         Prob > chibar2 =   0.3332
```

Appendix 3: Trade-off between a Fixed Effects Model and a Random Effects Model

```
hausman fe re

                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re          Difference          S.E.
-------------+----------------------------------------------------------------
          x1 |    .0248721     .0968516       -.0719794        .0233017
          x2 |   -.0082542     .0187659         -.02702        .0151061
          x3 |   -.0103839    -.0105088        .0001248        .0075118
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       15.82
                Prob>chi2 =      0.0012
```