

# **The Role of Financial Ratios in Measuring and Evaluating Liquidity Risks in Banking Institutions Case Study of BEABank, AGBBank and SGABank During the Period 2015-2021**

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**Abstract:** We aim through this research to identify the extent of the effectiveness of financial ratios in measuring and assessing liquidity risks in banking institutions, because the measurement and earlier assessment of liquidity risks in banking institutions would discover deficiencies in the inconsistency and the disproportionate between liquid liabilities and liquid obligations, and correct and rectify them and take remedial measures appropriate that will avoid falling into liquidity risk. In order to achieve the study's objectives, we followed both the descriptive and analytical approaches to prepare the research, the financial ratios method was used to apply the case study approach to three banking institutions in Algeria, based on their financial statements during the period 2015-2021. The study concluded that the method of financial ratios is considered one of the most accurate methods for measuring and assessing liquidity risks in banking institutions, which facilitates their management and their control, but this is only achieved by the validity and integrity of the financial statements that reflect the true figure of the status and the financial position of banking institutions.

**Keywords:** Banking Institutions; Liquidity; Liquidity Risks; Measuring and Evaluating; Financial Ratios.

**JEL classifications codes:** C43 ; G21 ; G32

## **I- Introduction:**

Banking institutions, by virtue of their full and absolute dealings with liquid and semi-liquid funds, on one side, and investing them with their own money and with the money of others, on the other side, are vulnerable to a set of unexpected crises such as the financial crisis that struck the world in the year 2008, which devastated the banking systems across the world, which caused a set of banking risks, such as operational risks, credit risks, and market risks, especially liquidity risks, the latter has clear and serious damage to banking activity and work, and if it is long, it affects the situation, stability and financial balance of banking institutions, which could expose them to financial failure in the future.

On this basis, banking institutions must form an effective internal and even external system to manage and cover the risks that interrupt banking work, especially the risks immanent in the banking activity of different types, sizes, nationalities and specializations such as liquidity risks, the latter is conducted and managed by banking institutions through the development of special plans and strategies, in addition to adopting advanced techniques, methods and ways to control and measure it for early detection of the potential occurrence of liquidity risk, and this through the use of a set of methods developed by a group of experts in the field of banking and finance, among the most prominent of these methods, we find the financial ratios calculated based on the financial statements of banking institutions, especially the budget, and the financial ratios have a fundamental and important role in evaluating financial performance, financial planning and predicting the financial situation, in addition to measuring banking risks such as liquidity risks.

Therefore, we ask the following main question:

**To what extent can financial ratios measure, estimate and evaluate liquidity risk in banking institutions operating in Algeria during the period 2015-2021?**

**The sub-questions of the study:**

To answer this main question, we ask the following sub-questions:

- Is measuring liquidity risk considered necessary to manage liquidity risk in banking institutions?
- What are the main financial ratios used in measuring and evaluating liquidity risks in banking institutions?
- How effective are the financial ratios measuring and evaluating liquidity risk in the banking institutions under study?

**Hypothesis:**

Based on the research problem and in order to facilitate the answer to the sub-questions raised, we lay down the following hypotheses:

- The first hypothesis: The process of measuring liquidity risk is considered one of the necessary and required phases of liquidity risk management in banking institutions, in order to draw up a well-defined future liquidity plan, in order to avoid falling into liquidity risks;
- The second hypothesis: The method of financial ratios is considered one of the main methods of measuring and evaluating liquidity risk in banks, and it depends on a set of ratios that are calculated depending on some elements and financial data in the bank's balance sheet, and these ratios are many and varied;
- The third hypothesis: the variety and multiplicity of the financial ratios used in measuring and evaluating liquidity risks in banks allow earlier detection of liquidity risks in the banks under study.

**The Objectif of the study:**

This study strives to achieve a set of objectives, including:

- List and present the importance of measuring and estimating liquidity risk in banking institutions;

- Determining the different financial ratios used in measuring and estimating liquidity risk in banking institutions;
- Using the method of financial ratios to measure liquidity risks surrounding banks operating in Algeria during the period 2015-2021.

### **The importance of the study:**

This study derives its importance from the need to highlight the ability of financial ratios to measure, estimate and evaluate the liquidity risks surrounding banking institutions operating in Algeria during the period 2015-2021, to find out its liquidity status and the extent of its exposure to liquidity risk based on its financial statements included in its financial statements, especially the balance sheet, in order to adopt a liquidity plan and take appropriate measures to face liquidity risks, reduce their intensity or prevent them from occurring.

### **Methodology:**

To answer the research problem, we relied on the descriptive approach and the analytical approach in the theoretical part, so that we touched on the theoretical literature of the study and analyzed previous studies related to the subject of the study, as for the applied part, we used the case study approach by applying the method of financial ratios to measure and evaluate liquidity risks on three banking institutions active in Algeria, based on their financial statements during the period 2015-2021.

## **II- Background of the study:**

### **1- The liquidity risks in banking institutions:**

Liquidity risk is the risk that institutions will not have sufficient cash to meet their financial commitments in a timely manner. Without proper cash flow management and sound liquidity risk management, institutions will face a liquidity crisis (Wirija, 2020). Banks face two types of liquidity risk: Accidental Liquidity Risk; funding risk and market liquidity risk (Scannella, 2016, p. 5) (Mohammed Eltayeb Ali, 2020, p. 733).

The bank liquidity risk is that the bank cannot meet the loan requirements needed from customers, and it cannot meet its obligation to repay the funds to depositors due to the deficiency of sufficient liquidity, which forces it, on one side, to sell some of its assets at low prices in the short term, and on the other side, trying to obtain new loans or deposits, and this is due to weak management of assets and liabilities.

All banking institutions are exposed to liquidity risks, whether conventional or Islamic banks. The latter are also exposed to liquidity risks, as they limit their ability to grant various formulas of Islamic financing such as (NAHOUI & GUETTOUCHE, 2021, pp. 697-698): Musharaka, Ijara, Mudaraba, Murabaha, Salam, and Istisna.

A bank is responsible for the sound management of liquidity risk. A bank should establish a robust liquidity risk management framework that ensures it maintains sufficient liquidity, including a cushion of unencumbered, high-quality liquid assets, to withstand a range of stress events, including those involving the loss or impairment of both unsecured and secured funding sources. Supervisors should assess the adequacy of both a bank's liquidity risk management framework and its liquidity position and should take prompt action if a bank is deficient in either area in order to protect depositors and to limit potential damage to the financial system (Basel Committee on Banking Supervision, 2008, p. 3).

There are three facets of liquidity risk management: Assessment and management of net funding needs, market access, and contingency planning. A significant part of liquidity risk management is the estimation of potential future events. The analysis of net subsidizing prerequisites involves the construction of a maturity ladder and the calculation of the cumulative net excess or deficit of funds on selected dates (Hacini, Bouloufad, & Dahou, 2021, p. 69).

Measuring liquidity risk is one of the main phases of liquidity risk management. The measurement, it allows knowing the size of the liquidity risk, and thus predicting and initiating the procedures and steps that must

be followed in the short and medium term so that the banking institution does not fall into a deficiency of bank liquidity. Therefore, the bank must develop mechanisms and methods for measuring and estimating liquidity risks, and the most prominent of these methods is (BENKHEZNADJI, GAIDI, & BENTOUMI, 2018, p. 172): method of successive difference; accumulated differences method; method of assets and liabilities weighted (indicators of liquidity risk "the method of financial ratios").

## 2- Method of financial ratios to measure liquidity risk in banks:

Liquidity risk is usually measured as liquidity ratio which is practically calculated in two different forms: In the first type, liquidity is adjusted by size which includes the ratio of cash asset to total asset ie the ratio of cash asset to deposit (savings); The second type however includes the adjusted loan by the size which includes the ratio of total asset and/or the ratio of net loan to total asset (ZERARGUI, 2019, p. 201).

The method of financial ratios is one of the main methods by which liquidity risk is measured in banks. Based on the financial data of the financial statements of banks, notably the balance sheet, there are several financial ratios that can be relied upon to measure liquidity risk and guiding liquidity risk management. We can divide the financial ratios into four groups as follows: a group for liquid and semi-liquid employment uses; a group for non-liquid employment uses in the form of loans; a group for non-liquid employment uses in the form of investments in financial assets; a special group for employment uses in general. They are shown as follows:

- **The first group: Special group for liquid and semi-liquid employment uses:** Among the main ratios we find:

- ✓ Cash Covering Ratio:  $\text{Liquid Assets} / \text{Total Assets}$ .
- ✓ Cash balance ratio (instant liquidity) 1:  $\text{liquid assets} / (\text{deposits and short-term financings})$ .
- ✓ Cash balance ratio (instant liquidity) 2:  $\text{liquid assets} / \text{deposits}$ .

- ✓ Semi-liquid assets to deposits ratio:  $(\text{semi-liquid assets}) / \text{deposits}$ .
- ✓ The ratio of semi-liquid assets to deposits and short-term financings:  $\text{semi-liquid assets} / (\text{deposits and short-term financings})$ .
- ✓ Semi-liquid assets to total assets ratio:  $\text{semi-liquid assets} / \text{total assets}$ .
- ✓ General Liquidity Ratio 1:  $(\text{liquid and semi-liquid assets}) / (\text{deposits and short-term financing})$ .
- ✓ General Liquidity Ratio 2:  $(\text{liquid and semi-liquid assets}) / \text{deposits}$ .
- ✓ The ratio of liquid and semi-liquid assets to total assets:  $(\text{liquid and semi-liquid assets}) / \text{total assets}$ .
- ✓ The ratio of cash to short-term financings:  $\text{liquid assets} / (\text{short-term financings})$ .
- ✓ The ratio of cash and semi-cash to short-term financings:  $(\text{liquid and semi-liquid assets}) / \text{short-term financings}$ .
- **The second group: Special group for non-liquid employment uses in the form of loans:** Among the main ratios we find:
  - ✓ The ratio of loans to total assets:  $\text{loans} / \text{total assets}$ .
  - ✓ The ratio of loans to deposits and short-term financings:  $\text{loans} / (\text{deposits and short-term financings})$ .
  - ✓ Inter-bank rate:  $\text{funds accorded to other banks} / \text{funds borrowed from other banks}$ .
  - ✓ The ratio between customers (the rate of lending customer deposits):  $\text{loans to customers} / \text{deposits from customers}$ .
  - ✓ Deposit lending ratio (employment rate):  $\text{loans} / \text{deposits}$ .
  - ✓ Liquidity surplus/deficit from financial institutions and customers:  $\text{Borrowings and deposits from financial institutions and customers} - \text{Loans to financial institutions and customers}$ .

- ✓ Liquidity surplus/deficit from financial institutions: borrowings and deposits from financial institutions - loans to financial institutions.
- ✓ Liquidity surplus/deficiency from customers: Deposits from customers - loans to customers.
- **The third group: Special group for employment uses in the form of investments in financial assets:** Among the main indicators we find:
  - ✓ Employment investments ratio: (Short, medium and long term investments) / (debt in the form of financial investments).
  - ✓ Short-term employment investments ratio: Short term investments / debt in the form of financial investments.
  - ✓ Medium and long term employment investments ratio: medium and long-term investments / debt in the form of financial investments.
- **The fourth group: Special group for employment uses in general:** Among the main ratios we find:
  - ✓ Illiquid employment uses to illiquid employment resources ratio: (Loans, medium and long term investments) / (deposits and debt investments).
  - ✓ Cash rate:(liquid assets and loans to financial institutions) / (lendings and deposits of financial institutions and customers).
  - ✓ Ratio of general employment uses to total assets: (liquid and semi-liquid liquidity, loans, and investments to maturity) / total assets.
  - ✓ The ratio of employment uses to employment resources: (liquid and semi-liquid liquidity, loans) / (deposits and short-term financing).
  - ✓ The ratio of public employment uses to public employment resources: (liquid and semi-liquid liquidity, loans, investments to maturity) / (deposits, short-term financings and investment debts).
  - ✓ Liquid employment uses to non-liquid employment uses ratio:(liquid and semi-liquid assets) / (medium and long-term loans and investments).



- ✓ The ratio of liquid employment resources to non-liquid employment resources: short-term financings / loans, deposits, and investment debts.

### **III- The empirical methodology:**

We will measure and evaluate the liquidity risks in each of the Bank of Algeria Foreign, the Gulf Bank of Algeria and the Bank of Society General, through some of the financial ratios that we mentioned on previously, and before calculating these ratios, we extracted a set of financial data from the financial statements found in the annual reports of the banks under study for the period from 2015 to 2021, so that those annual reports were obtained from the websites of the banks under study. The financial data that we extracted from the financial statements are: liquid assets (fund, central bank, public treasury, CCP); semi-liquid assets (financial assets owned for the purpose of dealing, financial assets ready for sale); non-liquid assets (loans and accounts with financial institutions, loans and accounts with customers, financial assets owned to maturity); total assets; short-term financings (central bank); borrowings and deposits of financial institutions (debts to financial institutions) and customers (debts to customers); Debt in the form of investments (debt represented by a security).

After extracting the financial data that we need in order to calculate the financial ratios for measuring bank liquidity risks in the banks under study during the period 2015-2021, we ordered and tabulated them, using the Microsoft Excel 2013 application, according to the budget elements (liquid, semi-liquid and non-liquid assets of employment and on The form of investments, liquid and non-liquid employment liabilities and in the form of investment debts) used to measure liquidity risk using the following financial ratios: Cash Coverage Ratio (RL1); Ratio of Liquid and Semi-Liquid Assets to Total Assets (RL2); Cash balance ratio (instant liquidity) (RL3); General liquidity ratio (RL4); Loans to Total Assets Ratio (RL5).

The results of calculating and measuring liquidity risks for the banking institutions under study (BEA, AGB and SGA) during the period 2015-2021 were as follows:

- **BEA Bank (Algeria Foreign Bank):** So that the financial ratios of the bank were extracted, as shown in the following table:

**Table 1.** Financial ratios that measure the liquidity risk of BEA Bank

Financial ratios	2015	2016	2017	2018	2019	2020	2021
<b>RL1 ratio</b>	14,05%	17,82%	24,00%	15,55%	12,63%	12,13%	21,48%
<b>RL2 ratio</b>	17,92%	23,04%	27,96%	17,84%	14,59%	13,80%	42,29%
<b>RL3 ratio</b>	17,62%	22,18%	29,86%	19,92%	18,25%	16,05%	26,17%
<b>RL4 ratio</b>	22,47%	28,66%	34,79%	22,85%	21,09%	18,26%	51,53%
<b>RL5 ratio</b>	67,38%	65,26%	62,75%	72,66%	74,54%	75,41%	47,66%

**Source:**Prepared by the researcher based on the annual reports of the Bank.

**(La Banque Extérieure d'Algérie BEA)**

- **AGB Bank (Algeria Gulf Bank):** So that the financial ratios of the bank were extracted, as shown in the following table:

**Table 2.** Financial ratios that measure the liquidity risk of AGB Bank

Financial ratios	2015	2016	2017	2018	2019	2020	2021
<b>RL1 ratio</b>	27,82%	15,60%	23,92%	12,64%	15,09%	12,92%	18,24%
<b>RL2 ratio</b>	27,82%	15,60%	23,92%	12,64%	15,09%	12,92%	23,24%
<b>RL3 ratio</b>	39,37%	21,68%	30,73%	16,83%	21,03%	17,15%	23,86%
<b>RL4 ratio</b>	39,37%	21,68%	30,73%	16,83%	21,03%	17,15%	30,40%
<b>RL5 ratio</b>	64,28%	71,93%	65,62%	76,72%	70,63%	72,36%	64,10%

**Source:**Prepared by the researcher based on the annual reports of the Bank.

**(Gulf Bank Algérie AGB)**

- **SGA Bank (Society General Bank):** So that the financial ratios of the bank were extracted, as shown in the following table:

**Table 3.** Financial ratios that measure the liquidity risk of SGA Bank

Financial ratios	2015	2016	2017	2018	2019	2020	2021
<b>RL1 ratio</b>	20,11%	23,14%	21,95%	22,92%	24,37%	20,87%	21,75%
<b>RL2 ratio</b>	22,33%	28,87%	29,78%	28,16%	32,39%	40,46%	45,28%
<b>RL3 ratio</b>	25,66%	28,75%	26,88%	28,59%	30,93%	26,15%	27,50%
<b>RL4 ratio</b>	28,49%	35,88%	36,46%	35,13%	41,11%	50,70%	57,24%
<b>RL5 ratio</b>	74,73%	68,12%	64,59%	68,69%	63,91%	54,42%	49,35%

**Source:**Prepared by the researcher based on the annual reports of the Bank.

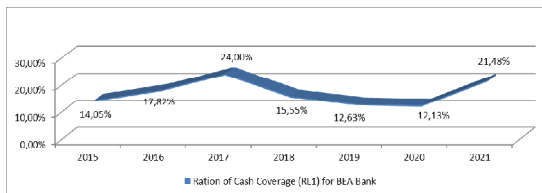
(Société Générale Algérie SGA)

#### IV- Results and discussion:

The results of calculating and measuring liquidity risk in the banks under study during the study period demonstrated a variation in the financial ratios that measure liquidity risk from one bank to another, as follows:

- **BEA Bank (Foreign Bank of Algeria):** The results of calculating and measuring liquidity risk demonstrated the following:

For additional clarification, in order to accurately and properly comment on the table, we use the following figures for analysis, and evaluation:

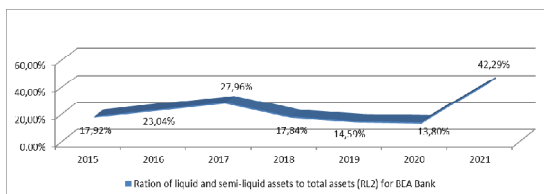
**Fig.1.** Ration of Cash Coverage (RL1) for BEA Bank

**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the cash coverage ratio demonstrated fluctuating and unacceptable results during the years 2015, 2016, 2018, 2019, 2020. This last year was during the period of the Corona pandemic

(Covid-19), when most banks around the world experienced a deficiency of cash liquidity, as the bank was exposed to Continuity of liquidity risks, except for the year 2017, the level of liquidity was somewhat acceptable, and also in the last year of the study (year 2021) the bank experienced an increase and recovery in the amount of its liquidity, and it was able to somewhat overcome the risk depending on the its available liquidity;

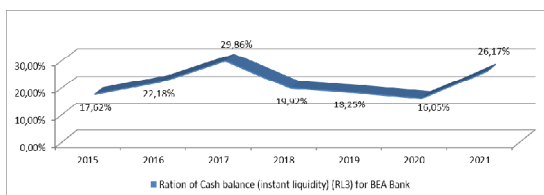
**Fig.2.**Ration of liquid and semi-liquid assets to total assets (RL2) for BEA Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the ratio of liquid and semi-liquid assets to total assets demonstrated unstable and less acceptable results during the years 2015, 2016, 2018, 2019, 2020. This last year, was during the period of the Covid, when most banks witnessed deficiency of liquidity, especially liquid liquidity. The bank has always been exposed to liquidity risks, except for the year 2017, when the level of liquid and semi-liquid liquidity was somewhat acceptable. Also, in the last year of the study (2021), the bank experienced a very noticeable increase and recovery in its liquidity volume, (liquid and semi-liquid liquidity), and it was able to somewhat overcome the danger depending on his liquid and semi-liquid liquidity;

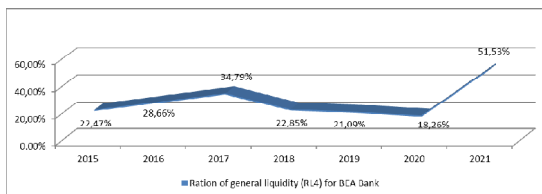
**Fig.3.**Ration of Cash balance (instant liquidity) (RL3) for BEA Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the cash balance ratio demonstrated fluctuating and unacceptable results, especially during the years 2015, 2018, 2019, 2020, as the bank was unable to face more than 20% of deposit withdrawals and short-term financings depending on its cash liquidity, and this suggests that it was exposed to the risks of bank liquidity during those years, but in the last year of the study (2021) that percent increased to 26.17%, so that the bank experienced a significant increase and recovery in the amount of its cash liquidity, through which it can face more than  $\frac{1}{4}$  (a quarter) of deposit withdrawals and short-term financings, and it was able to some extent to overcome the risk depending on its available liquidity;

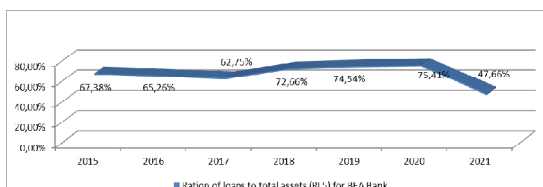
**Fig.4.**Ration of general liquidity (RL4) for BEA Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the general liquidity ratio demonstrated varying and unacceptable results, especially during the years 2015, 2016, 2018, 2019, 2020, as the bank was unable to face more than 30% of deposit withdrawals and short-term financings, depending on its cash and semi-financial liquidity cash, and this suggests that it was exposed to the risks of liquidity during those years, but in the last year of the study (2021) that ration increased to 51.53%, so that the bank experienced a very noticeable increase and recovery in the amount of its cash and semi-cash liquidity, which can through which faced more than  $\frac{1}{2}$  (half) of deposit withdrawals and short-term financings, and it was able to somewhat overcome the risk depending on the cash and semi-cash liquidity available to it;

**Fig.5.**Ration of loans to total assets (RL5) for BEA Bank



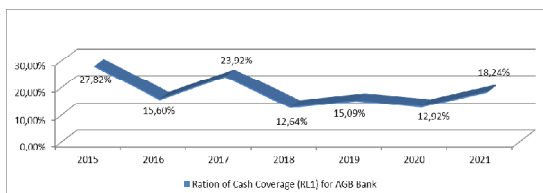
**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the ratio of loans to total assets demonstrated varying and unacceptable results, especially during the years 2018, 2019, and 2020, as more than 70% of the bank’s assets was frozen in the form of loans for a period of more than a year (12 Months), and this suggests that the bank was relatively exposed to bank liquidity risks during those years, but in the last year of the study (year 2021), this percent decreased to 47.66%, so that the bank experienced a very noticeable increase and recovery in the amount of its liquidity, and as we noted previously, this was due to the semi-cash liquidity it maintains to face emergencies of bank liquidity deficiency.

- **AGB Bank (Gulf Bank Algeria):** The results of calculating and measuring liquidity risk demonstrated the following:

For additional clarification, in order to accurately and properly comment on the table, we use the following figures for analysis, and evaluation:

**Fig.6.**Ratio of Cash Coverage (RL1) for AGB Bank

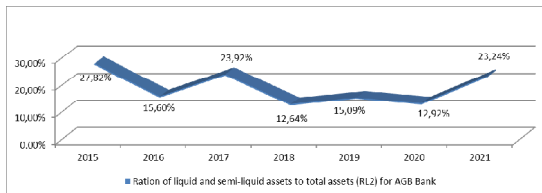


**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the cash coverage ratio demonstrated fluctuating and unacceptable results during the years 2016, 2018, 2019,

2020, and 2021. These last two years were during the period of the Corona pandemic (Covid-19), when most banks around the world experienced a deficiency of cash liquidity, as the bank was exposed always exposed to liquidity risks, except for the year 2015 and 2017, the level of liquidity was somewhat acceptable. In 2021, despite the cash coverage ratio was less than required (20%), it was somewhat acceptable compared to the three years that preceded it. The bank has a somewhat acceptable relative increase and recovery in its liquidity amount and it has been able to some extent to overcome the risk depending on the liquidity available to it;

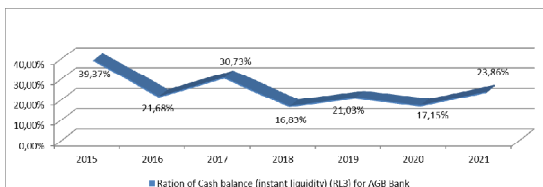
**Fig.7.**Ration of liquid and semi-liquid assets to total assets (RL2) for AGB Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the ratio of liquid and semi-liquid assets to total assets demonstrated unstable and unacceptable results during the years 2016, 2018, 2019 and 2020. This last year, as we said earlier, was during the period of the Corona pandemic, when most banks around the world experienced a deficiency of Liquidity, especially liquid liquidity, the bank was always exposed to liquidity risks, except for the year 2015 and 2017, the level of liquid and semi-liquid liquidity was somewhat acceptable, and the same for the last year of the study (year 2021), where the bank knew an acceptable rise and recovery to a lesser degree In the amount of its liquidity (liquid and semi-liquid), and he was able to somewhat overcome the danger depending on its liquid and semi-liquid liquidity;

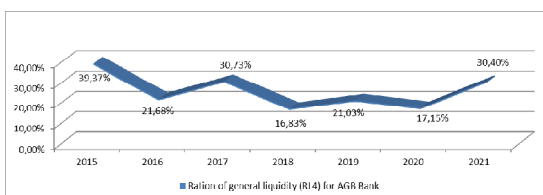
**Fig.8.**Ration of Cash balance (instant liquidity) (RL3) for AGB Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the cash balance ratio demonstrated fluctuating and unacceptable results, especially during the years 2018 and 2020, as the bank was unable to face more than 20% of deposit withdrawals (financial institutions and customers) and short-term financings depending on its cash liquidity, and this suggests that it was exposed to the risks of bank liquidity during those years, but in the last year of the study (2021) that percent increased to 23.86%, so that the bank experienced a significant increase and recovery in the amount of its cash liquidity, through which it can face more than 1/5 (five) deposit withdrawals (financial institutions and customers) and short-term financings, and he was able to somewhat overcome the risk depending on the liquidity available to it;

**Fig.9.**Ration of general liquidity (RL4) for AGB Bank



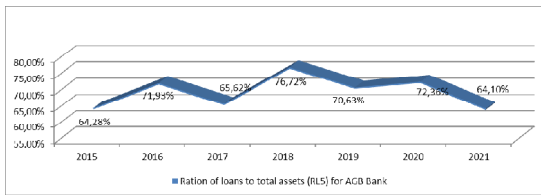
**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the general liquidity ratio demonstrated varying and unacceptable results, especially during the years 2016, 2018, 2019, and 2020, as the bank was unable to face more than 30% of deposit withdrawals (financial institutions and customers) and short-term financings, depending on its cash and semi-cash liquidity. This suggests that it was exposed to the risks of bank liquidity during those years, but in



the last year of the study (year 2021) that percent increased to 30.40%, so that the bank knew an increase and recovery to a lesser extent in the amount of its cash and semi-cash liquidity, through which it can Facing about 1/3 (one-third) of deposit withdrawals and short-term financings, and it was able to somewhat overcome the risk depending on the cash and semi-cash liquidity available to it;

**Fig.10.**Ration of loans to total assets (RL5) for AGB Bank



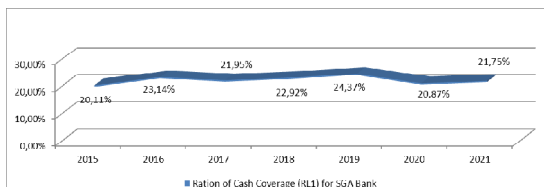
**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the ratio of loans to total assets demonstrated varying and unacceptable results, especially during the years 2016, 2018, 2019 and 2020, as more than 70% of the bank's assets was frozen in the form of loans for a period of more than a year, and this suggests that the bank was relatively exposed to bank liquidity risks during Those years, but in the last year of the study (year 2021), that percent decreased to 64.10%, so that the bank knew an increase and recovery to a lesser extent in its liquidity amount.

- **SGA Bank (Society General Bank):** The results of calculating and measuring liquidity risk demonstrated the following:

For additional clarification, in order to accurately and properly comment on the table, we use the following figuresfor analysis, and evaluation:

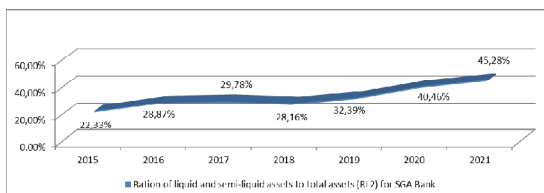
**Fig.11.**Ration of Cash Coverage (RL1) for SGA Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

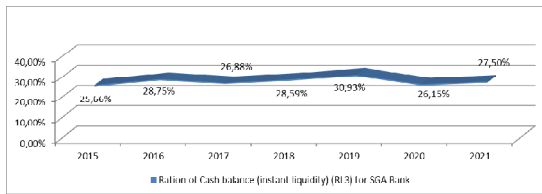
Through the above figure, the cash coverage ratio demonstrated close and somewhat acceptable results during all the years of the study(From 2015 to 2021). In the last year of the study (year 2021), the bank experienced an acceptable increase in the amount of its liquidity, and it was somewhat able to overcome theliquidity risk depending on its available liquidity;

**Fig.12.**Ration of liquid and semi-liquid assets to total assets (RL2) for SGA Bank



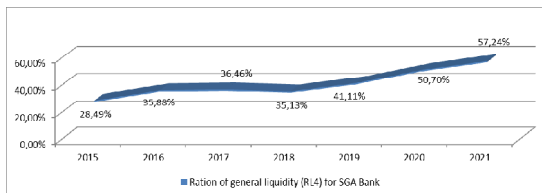
**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the ratio of liquid and semi-liquid assets to total assets demonstrated acceptable and increasing results during all the years of the study, especially the last two years of the study period, as the bank was very clearly insured against liquidity risks. The bank has a very acceptable rise and recovery in its liquidity volume (liquid and semi-liquid), and it was able to overcome the risk depending on its liquid and semi-liquid liquidity;

**Fig.13.**Ration of Cash balance (instant liquidity) (RL3) for SGA Bank

**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the cash balance ratio demonstrated very satisfactory and acceptable results during all the years of the study, so that the bank was able to face more than 25% of deposit withdrawals (financial institutions and customers) and short-term financings depending on its cash liquidity, and this suggests that it was insured against bank liquidity risks during those years. In the last year of the study (year 2021), this percent increased to 27.50%, so that the bank experienced a significant increase and recovery in the amount of its cash liquidity, through which it can face more than  $\frac{1}{4}$  (quarter) Deposit withdrawals (financial institutions and customers) and short-term financings, and it was able to somewhat overcome the risk depending on the liquidity available to it;

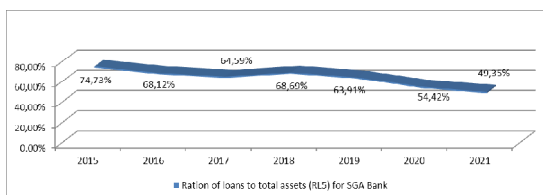
**Fig.14.**Ration of general liquidity (RL4) for SGA Bank

**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the general liquidity ratio demonstrated less acceptable results during the year 2015, as the bank was unable to face more than 30% of deposit withdrawals (financial institutions and customers) and short-term financings depending on its cash and semi cash liquidity, and this suggests that it was exposed to the risks of bank liquidity

during that year, but in the rest of the years, the results were very acceptable and increasing during all those years, especially the last two years of the study period, as the bank was in a very clear insurance liquidity risks. That percent increased to 57.24%, so that the experienced witnessed a very noticeable increase and recovery in amount volume of its cash and semi cash liquidity, through which it can face more than ½ (half) of deposit withdrawals (financial institutions and customers) and short-term financings, and it was able to exceed The risk depends on the cash and semi cash available to it;

**Fig.15.**Ration of loans to total assets (RL5) for SGA Bank



**Source:**Prepared by the researcher using Microsoft Excel 2013 application

Through the above figure, the ratio of loans to total assets demonstrated unacceptable results in 2015, as more than 70% of the bank’s assets was frozen in the form of loans for a period of more than a year(12 months), and this suggests that the bank was relatively exposed to bank liquidity risks during that year, while in the rest Years(From 2016 to 2021), the results were very acceptable and decreasing during all those years, especially the last two years of the study period, as the bank was very clear of liquidity risks. The bank has a very noticeable rise and recovery in its liquidity amount.

**Conclusion:**

In order to avoid liquidity risks and the rest of the risks resulting from them in the future, banking institutions must strive early detection of liquidity risks, through analyzing, overseeing and managing the liquidity they have, this requires effective liquidity risk management, starting by

defining, measuring and estimating, analyzing, estimating and covering of which. Banking institutions should also develop clear, sound and rigorous strategies for an effective liquidity plan, which is through the use and regard of legal texts, standards, instructions and regulations governing banking work. Through this research, the main financial ratios have been determined, which are considered one of the main modern methods for measuring and managing liquidity risks at banking institutions wide.

We have concluded the following **theoretical and applied findings**:

- The method of financial ratios is considered one of the main methods for measuring and estimating liquidity risks in banking institutions;
- Financial ratios for measuring liquidity risk are plenty and many, and they are divided into groups, some of them are related to liquid and semi-liquid assets, some are related to non-liquid assets in the form of loans, and some are related to non-liquid assets in the form of financial investments, and some are related to employed assets in general;
- Each financial ratio measures liquidity risk from a perspective, and each financial ratio has an explanation and indication of liquidity risk and what must be followed to avoid liquidity risk. There are financial ratios that must be high to avoid liquidity risk, and there are financial ratios that must be low to avoid liquidity risk;
- As for the Algerian Foreign Bank, we noticed during the study period the development of its activity, that is, the increase in its total assets over the years, the increase in its turnover over the years, and the increase in the net result achieved annually, but it was suffering from a shortage and fluctuation in the amount liquidity (especially cash liquidity) in all years' study, except for the last year (2021), it experienced an increase and recovery in its liquidity amount, and it was able to somewhat overcome the danger depending on its semi-cash liquidity;
- As for the Gulf Bank of Algeria, we noticed, during the study period, the development of its banking activity, that is, the increase in its total assets over the years, the increase in its turnover over the years, and the

increase in the net result achieved annually, but it was suffering from a shortage and fluctuation in the amount of liquidity (especially liquidity cash) in all years' study, except for the last year (2021), it experienced a relative increase in the amount of its liquidity, cash and semi-cash;

- As for Society General Bank, we noticed during this period an impressive development in its activity, that is, an increase in its total assets over the years, an increase in its turnover over the years, and an increase in the net result achieved annually, and it was also able to face the risk of liquidity during all years' study depending on liquidity Cash and semi-cash liquidity that it had;
- By comparison between the three banking institutions under study during all years' study, we noticed that Society General Bank was able to face the liquidity risk effectively and efficiently during all the years' study, followed by the Algerian Foreign Bank, which was able to overcome the liquidity risk in the year 2021 (similar to other years where it was known to fluctuate In the amount of its liquidity), so that it knew an increase and recovery in the amount of its liquidity, especially the semi-cash liquidity, and in the Gulf Bank of Algeria, which was somewhat able to overcome the liquidity risk in the year 2021 (similar to other years where it knew a fluctuation in the amount of its liquidity), so that it knew a relative increase in the amount of its liquidity, cash and semi-cash liquidity.

We can **confirm or not confirm the hypotheses** as follows:

- **The first hypothesis:** To manage liquidity risks efficiently and effectively, in order to prevent or reduce their intensity, banking institutions must draw up a well-defined future liquidity plan, on one side, and carry out the process of measuring liquidity risks accurately, clearly and in a timely manner, on the other side. The process of measuring liquidity risk is one of the necessary and essential phases of managing liquidity risk in banking institutions. **(Hypothesis affirmed);**

- **The second hypothesis:** In order to correctly and rightly measuring liquidity risks, banking institutions use the newly and most effective methods, the most prominent of which is the method of financial ratios, which are calculated based on some elements of the bank's budget, and these elements determine the amount of the bank's liquidity, cash and semi-cash, in addition to the amount of borrowings, deposits, loans and banking facilities and financial investments, adding that, each financial ratio has its own significance in relation to the size of the bank's liquidity, and this indicates its multiplicity and diversity, according to the multiplicity and diversity of the elements of the bank's budget. **(Hypothesis affirmed);**
- **The third hypothesis:** The financial ratios used in measuring liquidity risk, whatever their significance or method of calculation, are effective in measuring liquidity risk in each of the Bank of Algeria Foreign, Bank of Gulf Algeria and Society General Bank, especially whether the financial statements component to their financial statements, such as the budget, are accurate and correct. **(Hypothesis affirmed).**

We conclude the following set of **recommendations**:

- Banking institutions must develop a strategic liquidity plan in order to conserve bank liquidity in the future, and work to manage assets and liabilities, especially with regard of their maturities;
- Banking institutions must vary their investments and assets in different and diverse terms, short, medium and long, on one side, and vary the sources of their financial resources with multiple and diverse terms, short, medium and long, on the other side;
- Banking institutions must be very careful to manage liquidity risks with all measures that assure the conservation of bank liquidity and make the best and most effective use of it, in a way that assures that it achieves profits and financial returns in parallel with not falling into liquidity risk;

- Banking institutions should assure that liquidity risks are measured and evaluated using the most effective methods and implements such as financial ratios.

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