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Managing and improving a Bank's profitability and liquidity in times of crisis

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ABSTRACT

As banks in recent years have been exposed to a series of crises ranging from the 2008 financial crisis, the Covid-19 pandemic, and now the devastating economic effects of Russia-Ukraine War, a critical analysis of how banks manage and improve their profitability and liquidity during a crisis is essential for discerning the improvement measures that must be adopted. In that context, this study used the integrative review as the methodology for evaluating different theories and literature on the strategies that most contemporary banks use for managing and improving their profitability and liquidity during times of crisis. Outcomes of thematic and narrative analysis of different studies on the strategies for managing and improving a bank's profitability and liquidity during times of crisis revealed that the major strategies used by most banks encompass maintaining balanced portfolios of liquid assets, liquidity ratio analysis, and stress testing. Other strategies were found to include asset-liability management (ALM), diversification of a bank's funding sources, a risk-based management approach, and the use of a contingency funding plan. Even if there is no crisis, the outcomes of the integrative review imply that bank crisis management, aimed at managing and improving a bank's profitability and liquidity, must be part of the organisational culture. It must be part of the organisational culture that improves a bank's overall resilience and constant preparedness to respond to and withstand all unfolding disruptions and discontinuities. Unfortunately, due to a gap arising from lack of a comprehensive model for managing and improving a bank's profitability and liquidity during a crisis, most banks were still found to face challenges of discerning how to do so more effectively and comprehensively whenever a crisis erupts. To respond to such a gap, this study proposed the proactive stress testing model for managing and improving a bank's profitability and liquidity during times of crisis. Such a model not only enriches the existing theories and literature on bank crisis management, but also its adoption will leverage effective mitigation of the crisis's devastating effects to improve a bank's overall profitability and liquidity during the crisis, and for a long period after the crisis.

Keywords: Bank Liquidity, Bank Profitability, Bank Risks, Bank Crisis Management

INTRODUCTION

In times of crisis, effective management and improvement of a bank's profitability and liquidity are critical for leveraging a bank's sustainability. They enhance the bank's seamless transition during the period of turbulence until stability sets in (Susanti & Bahtiar, 2023). Effective management and improvement of a bank's profitability and liquidity enable banking executives evaluate the magnitude of the unfolding crisis on a bank's profitability, liquidity, and performance. Through such analysis, the banking executives are able to discern the immediate remedial strategies that can be applied to improve the bank's profitability and liquidity during the crisis (Chaffai & Dietsch, 2015). Bank liquidity is a measurement of the availability of adequate or even excess cash and other easily cash-convertible assets that the bank has at its immediate disposal for financing its day-to-day operational activities (Abbas et al., 2022). A bank's liquidity is measured by the extent to which it has adequate or even excess liquid assets to respond to the withdrawal demands by the depositors and other required short-term financial obligations that are critical for leveraging a bank's effective performance.

Apart from cash received from daily deposits and loan repayments, such easily cash-convertible bank assets often encompass government bonds, Central Bank reserves, securities, and bonds, as well as other assets that can easily be sold and converted into cash during a crisis. Unfortunately, even if a crisis is not unfolding, most banks often still have liquidity challenges (Chaffai & Dietsch, 2015). This affects meeting the daily withdrawal demands of depositors and the constantly surging demands for different forms of credit facilities (Susanti & Bahtiar, 2023). To mitigate such risks during a crisis, banks can adopt strategies encompassing borrowing from other banks and credit unions, issuing debt securities, and securing debt securities. In the event of a crisis affecting deposits and the bank's earnings from loan repayments, the banking executives can often borrow funds from other financial institutions or credit unions (Negash & Veni, 2019). This can enable the bank to meet its daily liquidity requirements in the short run as it strategises to adopt more sustainable ways of improving its liquidity in the long run (White, 2023).

However, risks often arise from the high interest rates that other banks often charge for lending to a fellow financial institution. This can lead to an increase in cash outflows in the medium and long run, exacerbating rather than mitigating the bank's liquidity crisis. Besides borrowing from other financial institutions, the bank can also issue debt securities by using the assets received as collateral from other financial institutions to liquidate its existing assets (Schuchardt, 2023). Such assets that are often used by other financial institutions to secure loans encompass corporate bonds, treasury securities, and treasury bills. However, risks of issuing debt securities often arise from the fact that as the value of the securities decreases, the amount the bank has to pay out on short-term debts can also increase. This can exacerbate a bank's liquidity crisis. In effect, how a bank manages its liquidity during a crisis may also influence whether or not its profitability increases (Soper, 2023). A bank's profitability is measured by its net interest rate spread, which refers to the difference between the returns that the bank receives from loans and other interest-generating transactions and the rate it pays on deposits and borrowings (Abbas et al., 2019). Net interest rate spread is a critical determinant of a bank's profitability in a given period of time. This is because the higher the returns from loans and other activities relative to the rate the bank pays on deposits and borrowings, the more profitable the bank is considered to be.

Net interest rate spread is explained by the fact that most commercial banks earn interest incomes from an array of sources, such as deposits into cheque and savings accounts, as well as certificates of deposits (Veeramoothoo & Shawkat, 2022). Although these are obtained at low rates, commercial banks also obtain funds from wholesale deposits, shareholder equity, debt issuance, and various forms of loans, such as mortgages on property, student loans, credit card financing, home equity lending, asset financing, and car loans, which are offered at relatively higher interest rates. In this initiative, the primary function of the bank is to manage the interest rate that it pays depositors and the interest rate that it earns from loans. If the interest rate that it earns from loans is greater than the interest that it pays on deposits, the bank is considered to have a favourable net interest rate spread or profit margin (Veeramoothoo & Shawkat, 2022). To increase deposits from customers as sources of funds and earnings from loans, banks often engage in creative marketing strategies to attract, acquire, and retain new customers whilst also improving the loyalty of existing ones (Abbas, Iqbal & Aziz, 2020). Though these explain how banks operate during normal business periods to improve their profitability and liquidity, in periods of turbulence or a crisis, a number of credit and liquidity risks often emerge to undermine a bank's overall effective performance and profitability.

Credit risks connote the probability of the bank losing an enormous amount of funds due to the borrowers' failure to repay the loans. Credit risks can arise from a crisis that refers to a sudden event that can emerge to cause significant devastating effects on the economy (Durand, 2019). This often causes a recession or depression, undermining economic productivity and the capabilities of businesses and even individual citizens to repay the borrowed funds. Though a crisis is often interpreted to connote an economic phenomenon, it can also be instigated by political and social unrest, ecological factors, natural disasters, or pandemics like Covid-19 that froze entire economic activities (Abbas, Iqbal & Aziz, 2020). Political unrest, war, or conflicts can destroy the economy, causing a recession or a depression as economic activities are not only frustrated, but also resources are diverted to fighting wars instead of expenditure on more productive activities in the economy. This often leads to a crisis as the economy is thrown into turmoil, and businesses are also unable to engage in more productive activities (Kunt, Pedraza & Ortega, 2021). Regarding social unrest, a crisis can emerge if protracted riots by activists or labour unions persist for weeks or months, frustrating the smooth functioning of the economy.

Even if a crisis is not emerging from social unrest, it can also arise from health hazards, natural calamities, or pandemics like Covid-19, which threw the entire world economy into redundancy (Ogbeifuna & Akinola, 2018).

As this undermined the smooth operations of businesses, it subsequently caused business failure, closure, and loss of employment opportunities. This affected the earnings of individual citizens as well as the revenue-generating capabilities of businesses. The effect of all these on the performance of businesses was the increasing rate of non-performing loans (Chaffai & Dietsch, 2015). It is a combination of such crises that often increases the credit risks that financial institutions are exposed to. In the event of a crisis, credit risks do not only include the possibility of borrowers defaulting on their repayments but also the risk of the lender losing the interest payment and principal (Onaolapo & Adegoke, 2020). This leads to the disruption of cash flows and increased debt recovery and collection costs. During crisis situations, the losses that banks can experience can arise from the failure of most consumers to pay due mortgage loans, credit card balances, student loans, asset financing facilities, or other different forms of loans.

Losses can also arise if the consumer does not pay the trade invoice or the company fails to repay the floating charge debt (Owusu & Alhassan, 2020). Other instances where credit risks arise include circumstances where an employer does not pay wages to employees, a government bond issuer does not make due payments, an insurance company becomes insolvent and cannot honour policy obligations, or an insolvent bank fails to return funds to depositors. All these situations can arise during a crisis, increasing the credit risks that financial institutions are exposed to. Credit risk is an essential determinant of the spread between lending rates and market interest rates (Negash & Veni, 2019). Credit risks reflect the possibility that some loans will not be paid, others will not be paid in full, and some will take a costly long period to collect and recover from defaulting borrowers. If all banks are experiencing similar risks during a crisis, it reflects the aggregate credit risks that determine the circumstances for lending as well as banks' reactions to changes in market conditions. Yet, as banks face credit risks that affect the repayment of different forms of loans, it can also impact their profitability and liquidity. This can induce liquidity risk or crisis (Anggono, 2017). Liquidity risks or crises refer to a difficult business situation in which a bank finds itself unable to have adequate funds or capacity to borrow to respond to the withdrawal demands of depositors or the demand for new loans (Veeramoothoo & Shawkat, 2022). However, as more funds are invested in cash or cash equivalents, bank liquidity risks decline. This reduces the liquidity premium in bank spreads (Peykani et al., 2023). Liquidity risks affect a bank's operational efficiency and financial stability. They are often punctuated by two forms of risks: funding liquidity risks and market liquidity risks.

Funding liquidity risks refer to the difficulties that a bank experiences in seeking to obtain adequate funding to meet its daily financial obligations. Market liquidity risks connote the difficulty that a bank experiences in seeking to execute transactions at prevailing market prices without experiencing a loss due to insufficient market depth or disruptions (Michelangeli & Piersanti, 2023). Liquidity risks can be instigated by market changes, a sudden rise in liabilities, unforeseen expenses, or withdrawals. Liquidity risks arise from the mismatch between assets and liabilities, where assets cannot easily be liquidated at prevailing market prices to respond to unfolding short-term financial obligations. A liquidity crisis can affect a bank's capability to invest in new growth-leveraging activities to improve its profitability. It also induces financial losses arising from the sale of assets at lower prices to improve the bank's liquidity (Abebe, 2022). A liquidity crisis also affects operational efficiency as it causes operational disruptions that impact cash flows. Since these often instigate reputational damage, which can affect market performance, sales, and profitability, it is evident that a liquidity crisis can also easily drive a bank into insolvency or bankruptcy. Unfortunately, even though this is the case, little has still been done in existing studies to develop a comprehensive framework of strategies that banks can emulate during impending periods of crisis.

It is true that given the recent Covid-19-induced economic crisis, an avalanche of studies has been conducted on how to diagnose and mitigate crises that can affect banking performance (Shrestha, 2015). However, a challenge still arises from the fact that since each study just deals with a small aspect of the strategies that financial institutions can emulate, it often becomes difficult for banking executives to discern the bank crisis mitigating strategies that can be applied in the event of a crisis. Considering that modern business and financial markets are often characterised by turbulence, recessions, and depressions, this research uses an integrative review to evaluate, explore, and extract from existing studies a more holistic framework that can be adopted. Through the adoption of such a framework, the study aims to not only improve the effectiveness of the approaches used for managing and improving a bank's profitability and liquidity in times of crisis, but also enrich the existing theories and literature. To accomplish that, the analysis in the paper commences by elucidating the methodology used in the study before evaluating the key findings and the managerial implications reflecting the improvement initiatives that can banks can adopt.

METHODOLOGY

Methodology for the study entailed the use of integrative review as the method for accomplishing the review of different studies on managing and improving a bank's profitability and liquidity during times of crisis. This enabled the extraction of critical data for the study to reach a logical conclusion on the strategies for managing and improving a bank's profitability and liquidity during times of crisis (Cronin & George, 2023. In that regard, the process for the accomplishment of the integrative review was structured according to five steps encompassing systematic literature search, designation of inclusion/exclusion criteria, data extraction, data analysis and quality assessment (Sutton et al., 2019; Toronto, 2020). Systematic literature search was guided by the fundamental question for integrative review that states: what are the strategies for managing and improving a bank's profitability and liquidity during times of crisis that can be extracted and utilised from the existing studies? In line with this question, the keywords for the systematic search were formulated to guide the process of literature search and analysis (Hopia, Latvala & Liimatainen, 2016). Such keywords encompassed "bank crisis management", "bank profitability", "bank liquidity", "bank performance in times of crisis", "strategies for managing bank performance during crisis", "bank risk management strategies", "managing credit risks during a crisis", "managing bank liquidity during a crisis", "managing a bank's competitiveness during a crisis".

With the keywords for the systematic literature search outlined, the process of literature search utilised search engines like Google, Scopus, Embase and Web of Science to search, evaluate, extract and utilise only the studies that met the inclusion/exclusion criteria outlined below. To ensure that the integrative review process extracted only the articles that were relevant to the integrative review question, firstly, the inclusion/exclusion criteria required the inclusion of only the studies that reflect the keywords and deal more comprehensively with the strategies for managing and improving a bank's profitability and liquidity during crisis times. Secondly, the inclusion criteria also included only studies/articles, be they qualitative, quantitative or articles from grey literature, that reflected conceptually sound arguments on how to manage and improve a bank's profitability and liquidity during periods of turbulence. Thirdly, only the studies that were in English and conducted in the period between 2015 and 2023 were included in the integrative review. Fourthly, the study/article had to reflect the abstract, the full article, the author names, journal and publisher for it to be included in the integrative review.

After the designation of the clear inclusion/exclusion criteria, the process of data extraction commenced. Before an article was extracted, the title and abstract of each article were first read to ensure that they dealt with issues pertaining to the strategies for managing and improving banking profitability and liquidity during crisis times. This was accompanied by the reading of the full details of each of the articles to discern whether it elucidated any of the key concepts about managing banking performance during a crisis. The articles that met the inclusion criteria as well as those that reflected the elucidation of the required key concepts were included in the study. This process led to the extraction of eighty articles that were subsequently re-evaluated to lead to the selection of only 43 articles/studies. Each of the 43 articles/studies was subjected to a critical analysis in the process of data analysis that was accomplished using thematic and narrative analysis. While using thematic and narrative analysis, each of the 43 selected studies was read and re-read to improve familiarisation with the nature of the argument and the key insights about the strategies for improving the bank's profitability and liquidity during times of crisis. This was followed by thorough analysis of each of the articles and extraction of key themes that highlighted the strategies for managing and improving the bank's profitability and liquidity during crisis times. Such key themes were extracted on concepts and strategies like managing credit risks during a crisis, managing a bank's liquidity during a crisis, managing a bank's profitability during a crisis, usage of government subsidies and grants during the crisis, usage of bank reserves during the crisis and sale of bonds, securities and treasury bills during the crisis.

After the extraction of such themes, subthemes and texts that explain such themes were further extracted from each article. Since the themes and their accompanying texts were extracted from each article, themes and texts from different articles were then compared and contrasted with each other. This enabled the identification, combination and merging of common themes and texts from different articles. It also enabled the identification and development of new themes that emerged from the unique themes and texts that emerged from the articles. This led to the drawing of the thematic framework in **Figure 1**, which depicted how the emerging themes and subthemes offered coherent explanations on the comprehensive strategies for improving the bank's profitability and liquidity during times of crisis. Even though this enabled the study to achieve its fundamental research objective of developing the strategies for managing and improving a bank's profitability and liquidity during times of crisis, the entire process of integrative review was still accompanied by measures for improving the overall

quality of the study. To improve the quality of the study, the gathered studies were arranged alphabetically to ensure that the studies were not duplicated. The study also ensured that different articles were drawn from different parts of the world and not just from a particular country or region to aid in discerning how different banks deal with different forms of crisis (Hansen et al., 2022; Glass et al., 1981). In that context, the overall results of the integrative review are reflected below.

RESULTS

Outcomes of thematic and narrative analysis of different studies (Chaffai & Dietsch, 2015; Negash & Veni, 2019; Veeramoothoo & Shawkat, 2022; Abbas, Iqbal & Aziz, 2020) on the strategies for managing and improving a bank's profitability and liquidity during times of crisis revealed the major strategies used by most of the banks to encompass:

- Maintaining a Balanced Portfolio of Liquid Assets
- Liquidity Ratios Analysis
- Stress Testing
- Asset-Liability Management (ALM)
- Diversification of Bank's Funding Sources
- Risk-Based Management Approach
- Contingency Funding Plan

As illustrated in **Figure 1**, the details of these key themes and their accompanying narratives are evaluated as follows.

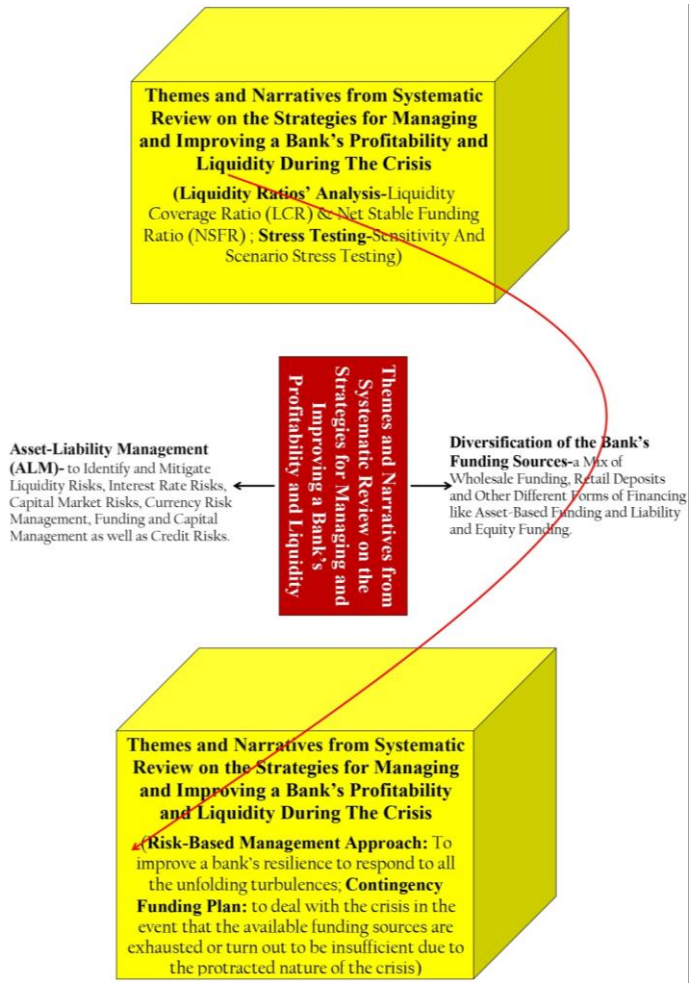

Figure 1. Reflection of Themes and Their Accompanying Narratives on the Strategies For Managing And Improving A Bank's Profitability And Liquidity During Times Of Crisis

Liquidity Ratios' Analysis

Integrative review of different studies revealed that bank liquidity ratios analysis is one of the strategies for managing and improving a bank's profitability and liquidity during the crisis (Kunt, Pedraza & Ortega, 2021). Liquidity ratios analysis informs the banking executives about the liquidity crisis that is most likely to affect a bank's performance. However, as it emerged from the views of different studies, liquidity ratios analysis is not the strategy that can be applied during the periods that the crisis is unfolding, but a proactive strategy. It is a proactive strategy that enables the banking executives to be informed of how the changes in the financial markets or the economy are most likely to affect a bank's performance (Ardekani, 2023).

Changes affecting savings, deposits and loan repayments imply the bank must introduce alternative sources of funding in order to respond to the unfolding daily financial obligations. It is a proactive strategy that enables the banks to control their expenditures and cash outflows to ensure that the available liquid assets are sufficient for meeting the unfolding daily financial liabilities (Abbas, Iqbal & Aziz, 2020). Though liquidity ratios analysis is a proactive strategy, it can also be used during the actual periods of the crisis.

During the crisis, it enables the bank to understand the magnitude of the effects of the unfolding crisis on its liquidity and financial performance. In that process, liquidity ratios analysis may require the utilisation of two ratios encompassing Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) (Veeramoothoo & Shawkat, 2022). During a stress scenario, Liquidity Coverage Ratio enables the bank to assess whether it has adequate high-quality liquid assets to meet its unfolding financial obligations for a period of at least thirty days. Net Stable Funding Ratio measures the bank's ability to maintain longer-term resilience by requiring a stable funding structure relative to the assets' liquidity profile.

Liquidity Coverage Ratio (LCR) measures the percentage of highly liquid assets that the bank has at its disposal to aid the meeting of the daily financial obligations as the crisis unfolds (Veeramoothoo & Shawkat, 2022). It is a generic stress test that assesses the market-wide shocks that the bank would be exposed to, ensuring that the bank has adequate liquid assets and capital preservation to meet all short-term obligations until the disruptions plaguing the market subside (Veeramoothoo & Shawkat, 2022).

The importance of LCR emerged from the Basel Accord, which reflects a set of regulations created by the Basel Committee on Banking Supervision. To improve the resilience of financial institutions to withstand all economic shocks, the Basel Committee on Banking Supervision requires banks to hold some level of highly liquid assets to maintain some level of fiscal solvency that can enable the banks to survive during economic turbulence and shocks (Ardekani, 2023). In effect, whether or not there is a crisis, banks are required to have a certain percentage of liquid assets that can enable them to operate for at least thirty days without seeking funding from any other alternative sources.

However, the limitation of such an approach is that some crises, like the recent Covid-19 devastating economic effects, induced shocks that unfolded for years. This implies that if the financial institution was not prepared enough with high-quality liquid assets that can enable it to survive for at least five years, it can become difficult for it to survive during Covid-19, the 2008 financial crisis and the recent shocks instigated by the Russia-Ukraine War that can take years and years to subside (Susanti & Bahtiar, 2023). High-quality liquid assets constitute actual cash or assets that can easily be sold at the prevailing market value and converted into actual cash. The Basel Committee on Banking Supervision requires banks to have high-quality liquid assets to cover their daily operations for at least thirty days for the reason that, within thirty days, the government or the central bank will have responded with the appropriate strategies and corrective measures to thwart the shocks (Kunt, Pedraza & Ortega, 2021).

However, as empirical facts have so proved, most of the time, the government or the central bank has failed to respond to diffuse certain shocks and disruptions. This implies that for the bank to have sound liquidity, it must adopt a more appropriate liquidity policy and strategies to ensure that it is always prepared to thrive and survive during any crisis for as long as the crisis continues to cause disruptions. And such a policy is not formulated and used during the crisis, but before the crisis, to enable the bank to build and improve its resilience before any crisis emerges (Waweru & Oribu, 2023).

For banks to discern the kinds of liquid assets that they must always have at their disposal, Basel III classifies the categories of liquid assets according to three levels encompassing Level 1, Level 2A and Level 2B. Level 1 Liquid Assets, which are not discounted when calculating the Liquidity Coverage Ratio (LCR), include liquid

assets like Reserve Bank balances, issued or guaranteed securities by the government or other sovereign entities, and foreign resources that can easily be withdrawn and quickly used to finance the unfolding daily obligations (Durand, 2019). Unlike Level 1, Level 2A and 2B liquid assets are discounted at 15% and 25-50%, respectively, when calculating the LCR. Level 2A assets often encompass securities issued or guaranteed by a multilateral development bank or certain government-sponsored entities.

Level 2B assets refer to the investment-grade corporate debt securities and the publicly traded common stock issued by non-financial sector organisations (Veeramoothoo & Shawkat, 2022). Though Basel III requires banks to attain a leverage ratio above 3% or 5%, most banks still maintain higher capital to insulate themselves from the risks of financial distress during a crisis, even if it would require lending limited amounts of funds to borrowers. For over thirty days' stress period, LCR is often calculated as follows:

Liquidity Coverage Ratio (LCR) = (High-Quality Liquid Asset Amount) / (Total Net Cash Flow Amount)

However, besides the Liquidity Coverage Ratio, which requires a bank to have high-quality liquid assets that are equal to or above its net cash flows, the Net Stable Funding Ratio (NSFR) is the other ratio used for evaluating and improving a bank's liquidity prior to, during, and after the crisis. NSFR evaluates and measures the financial capability of the bank to withstand shocks that span over a year or more (Veeramoothoo & Shawkat, 2022). It measures the equity and liability financing options that are expected to be more reliable sources of funding for over a year during periods of extended economic stress. To assess the percentage of long-term assets funded by stable funding, NSFR uses the formula:

Net Stable Funding Ratio = (Available Sources of Stable Funding) / (Required Sources of Stable Funding) ≥ 100%

As reflected in this formula, the obtained ratio must be equal to or more than 100%. In such an analysis, the amount of available stable funding refers to the preferred stock, liabilities with maturities greater than one year, and the bank's capital (Allahrakha, Cetina & Munyan, 2018). Liabilities with residual maturities shorter than one year that may not be withdrawn during the stress period may also be included as part of the amount of available stable funding.

Residual Stable Funding (RSF) reflects the weighted aggregate of the asset values held and funded by the bank. It includes off-balance sheet exposure as well as part of the assets that cannot be monetised through sales or collateralisation during a stress period that must be covered using a stable source of funding. The motive of the Net Stable Funding Ratio (NSFR) is to maintain stable funding for banks in accordance with the maturity profile of assets and the exposures that they represent (Veeramoothoo & Shawkat, 2022).

This is because a retail bank's business model is based on the transformation of short-term and cheap borrowing, like wholesale funding and savings accounts, into more profitable long-term investments using loans. Through such a model, the bank's profitability is attained through the interest margin realised from the difference between the interest paid and the interest received (Capponi & Chen, 2015).

Stress Testing

Stress testing is the process of evaluating the impacts of different stress scenarios on a bank's profitability, liquidity and performance (Miodrag, 2016). It enables the banking executives to diagnose and understand the magnitude of the impact of different stress conditions and variables on a bank's performance. During a crisis, such information is often critical for influencing the banking executives' decisions on the crisis-mitigating strategies that must be adopted as well as the areas that the executives must focus on (Miodrag, 2016). Stress testing evaluates whether a bank has sufficient liquidity and capital to withstand all financial and economic crises. To accomplish that, stress testing is often executed according to six logical steps encompassing analysis and identification of the specific areas of concern or vulnerabilities, constructing the required different scenarios, and mapping the results of scenario analysis to evaluate the bank's income statement and balance sheets (Schneider et al., 2023). It also entails execution of numerical analysis, evaluation of any second-round effects, and summarising and interpreting the results.

Depending on the sudden event that may occur to affect a bank's performance, stress testing is critical for evaluating the impacts of risks like credit risks, liquidity risks, interest rate shocks arising from direct and indirect interest rate risks, as well as foreign exchange risks or any other unfolding economic variables affecting a bank's performance and in what areas (Cortés et al., 2020). It is a computer-simulated process that enables the executives to test the bank's resilience to withstand all economic shocks induced by sudden crises like the 2008 financial crisis, Covid-19 pandemic, and the ongoing Russia-Ukraine War that has caused energy shortages and inflation. This enables the banking executives to evaluate the efficacy of their investment decisions as well as the internal control systems and processes to aid the bank in mitigating such risks and impending devastating effects of the crisis. This enables the bank to take actions to improve its capital and reserve requirements before the crisis becomes quite devastating (Gallardo et al., 2016).

In that process, stress testing is both a proactive and a reactive approach for evaluating the impacts of risks on a bank's performance. It can be done through modelling before the risks occur or during the occurrence of the risks/crisis to discern the kinds of interventions that must be undertaken. This enables the bank to modify the structures of its capital and assets to improve its resilience to respond to the unfolding risks. Since banks manage different assets and investments, stress testing is used for evaluating the portfolio risks that may arise so as to discern the hedging strategies that can be utilised to mitigate any possible losses that may arise. In that process, internal proprietary stress testing can be used to evaluate whether the bank has the requisite assets, capital and resources to withstand the identified shocks if they occur (Schneider et al., 2022). It also evaluates the asset-liability matching stress to discern the level of a bank's cash flow controls that are aimed at improving its liquidity and preparedness to withstand the identified shocks.

Following the 2008 financial crisis, regulatory modifications have been made through the 2010 Dodd-Frank Act to require banks to present reports on capital adequacy tests. Though some banks are deemed too big to fail, the regulation, Basel III, still requires all banks to evaluate and document their capital levels and reports on stress tests for various crisis scenarios (Aydemir et al., 2023). Stress testing may take the form of historical, hypothetical or simulated stress testing. Historical stress testing refers to where hidden vulnerabilities are identified by running tests on certain asset classes, portfolios and investments based on the data gathered from past crises. Hypothetical stress testing is based on hypotheses and assumptions that if a particular risk/crisis occurs, then the bank would experience certain undesired devastating effects.

Simulated stress testing is used for evaluating and modelling the impacts of various economic variables on a bank's performance (Barr, 2023). In a study titled "Stress Testing Tool in Banking Risk Management", Miodrag (2016) highlights the motives of sensitivity and scenario stress testing to encompass risk level analysis, portfolio weaknesses' evaluation and improving decision-making and planning on the improvement measures that must be adopted. In that process, stress testing aids the evaluation of a bank's cash flows, capital levels, deposits and performance of the credit facilities. In the United States, stress testing is almost mandatory for every bank since all banks are required by the Federal Reserve's Dodd-Frank Act Stress Test (DFAST) and Comprehensive Capital Analysis and Review (CCAR) Stress Test to evaluate their capabilities and resilience to withstand sudden emerging shocks.

Every year, the Federal Reserve applies the Comprehensive Capital Analysis and Review (CCAR) Stress Test to require all banks with $100 billion in assets to evaluate whether they have adequate or even excess capital to operate during sudden economic downturns (Miodrag, 2016). CCAR also examines whether they have a comprehensive contingent plan in place to aid smooth bank operations should such sudden events occur. As complemented with CCAR, the Dodd-Frank Act Stress Test (DFAST) requires banks with $250 billion in assets to review every year whether the bank has adequate capital to cover losses and continue with operations during a sudden disruptive event or a crisis (Glasserman, 2023). To accomplish that and assess the bank's overall strengths and vulnerabilities in the event that such a risk occurs, most bank stress testing often uses mathematical and statistical modelling techniques like linear models, econometric models, Monte Carlo simulation and other quantitative risk models.

Linear models are used for evaluating the potential impacts of such variables on a bank's performance should the risk occur. In that process, a linear model may take the form of simple linear regression analysis to evaluate the implications of just one variable, like withdrawals without deposit increments, on a bank's performance (Agarwal et al., 2020). It can also use multiple linear regression analysis to evaluate the impacts of a combination of various factors, like the impacts of increasing non-performing loans, declining loan demands, declining

deposits, increasing withdrawals, and negative reputation on a bank's profitability and liquidity during the crisis.

Alternatively, a linear model may also use multivariate linear regression analysis to evaluate the implications of an array of factors that would arise during the crisis to undermine the bank's profitability and liquidity (Bassett & Berrospide, 2018). Linear models enable the stress testing process to generate predictions about the implications of the expected and unexpected events. Through such analysis, linear models also generate solutions that can be adopted by comparing and evaluating linear model fits as well as goodness-of-fit of the solutions that can be adopted. Besides stress testing, outcomes of the integrative review also revealed most of the studies to suggest the usage of effective Asset-Liability Management (ALM) as one of the strategies for managing and improving a bank's profitability and liquidity in crisis times (Bassett & Berrospide, 2018).

Asset-Liability Management (ALM)

Asset-Liability Management (ALM) is the bank's strategic management process that ensures that the bank's assets are balanced with its liabilities to minimise liquidity risks and aid the bank's seamless operations in both crisis and non-crisis situations (Anggono, 2017). It requires effective coordination and striking an acceptable equilibrium between lending, investments, pricing, and funding to ensure the bank is able to meet its financial obligations as they fall due. As the bank engages in various investments, asset-liability management enables a bank to evaluate and discern whether it is maintaining the appropriate portfolio of liquid assets consisting of cash and easily cash-convertible assets that can be used to improve the bank's liquidity during the crisis (Anggono, 2017). It requires banks to create high-quality liquid assets to offer a safety buffer during times of liquidity crisis.

Asset-Liability Management is not only a bank crisis management strategy but also a risk management process that seeks to identify and minimise operational and liquidity risks that can arise from the mismatch of assets with liabilities. As part of the investment strategy, banks may tend to commit a lot of funds to assets that cannot be easily converted to cash in the quest to pursue faster growth in the long run (Peykani et al., 2023). But sudden events can occur to affect such a strategy and require banks to have high-quality liquid assets in order to respond. Unfortunately, with most of the cash committed to long-term investments, it often becomes difficult for some of the banks to respond to the events causing a crisis.

However, Asset-Liability Management seeks to eliminate that by integrating the quests for balancing assets with liabilities in the long-term investment plans. As banks engage in long-term investments, it also requires the balancing of assets with liabilities to meet all the unfolding daily obligations (Peykani et al., 2023). In such quests, Asset-Liability Management (ALM) focuses on identifying and mitigating liquidity risks, interest rate risks, capital market risks, currency risk management, funding and capital management, as well as credit risks. ALM mitigates liquidity risks by improving the bank's capabilities to meet its expected and unexpected cash flow obligations as well as collateral needs.

Mitigation of interest rate risks requires the elimination of mismatches between bank loans and deposits. This reduces risks arising from changes in interest rates that may affect the amount that the bank earns from the issued loans as compared to the interest rate that it pays to depositors (Owusu & Alhassan, 2020). Besides attempts to mitigate capital market risks, Asset-Liability Management also aims to reduce currency risks by ensuring that cash flow assets and liabilities are spread out in different currencies.

As this eliminates risks arising from the fluctuations of one currency, funding and capital management require the bank to adopt a dynamic process of ensuring capital adequacy through the investment periods as part of the contingency plan for responding to the expected as well as unexpected sudden events. ALM also aims to mitigate credit risks by adopting a more prudent approach to managing credit portfolios associated with cash, investments, and loans on the bank's balance sheet (Abebe, 2022).

Asset-Liability Management (ALM) achieves this by ensuring the appropriate mix of balance sheet assets like loans and leases such as residential mortgages, personal loans, commercial loans, finance leases, financial investments, intangible assets, cash and cash equivalents, trade and receivables, and other inventories. On the other hand, balance sheet liabilities would require striking a good mix of domestic interest-bearing deposits, term deposits, demand deposits, brokered deposits, short-term borrowings, long-term debt, non-interest-bearing liabilities, deferred revenue, and trade and other payables (Shrestha, 2015).

ALM uses techniques like immunisation or cash flow matching to link the maturities of investments and loans with the maturities of deposits, equity, and external credit. It also manages the spread between interest rate-sensitive assets and interest rate-sensitive liabilities. In addition to Asset-Liability Management (ALM), most studies evaluated during the integrative review also emphasised the importance of the diversification of the bank's funding sources as one of the strategies for managing and improving a bank's profitability and liquidity during the crisis (Onaolapo & Adegoke, 2020).

Diversification of Bank's Funding Sources

Diversification of the bank's funding sources is one of the strategies for improving the bank's overall liquidity and resilience to withstand all economic shocks (Nisar et al., 2018). This is because whenever a crisis sets in, most banks often experience a liquidity crisis due to reliance on just a few sources of funding. In effect, diversification of the funding sources can eliminate the bank's dependence and reliance on just a few sources of funding that can also be affected during the crisis. To mitigate such risks, diversification of the bank's funding sources may require the utilisation of a mix of wholesale funding, retail deposits, and other different forms of financing (Xie et al., 2022). Such different forms of financing are often reflected in two main sources of funding like asset-based funding and liability and equity funding. Asset-based funding refers to the forms of funding that can be raised by easily converting the asset into cash without experiencing any loss. Such asset-based funding sources encompass cash flows, asset pledging, liquidation or sale of assets, and asset securitisation.

Cash flows are the primary sources of the bank's asset-based funding that are drawn from maturing investments, loan amortisation reflecting the periodic cash flows of principal and interest, as well as mortgage-backed securities (Tchuigoua et al., 2017). These can be accompanied by the pledging of assets as securities for borrowings that the bank undertakes. Other sources of funding can arise from the sale or liquidation of assets/subsidiaries to generate additional cash that improves the bank's overall liquidity and capability to invest in new profit-generating ventures. Issuance of new loans can also be reduced to create additional cash that improves the bank's liquidity. Subsequently, the bank can also undertake asset securitisation to obtain loans from other banks that can be used as part of the pool of loans sold to different investors for different forms of interest-generating incomes (Manh & Nguyen, 2023).

Yet as the bank uses such various asset-based funding sources, it can also apply the liability and equity funding sources that often include retail funding, wholesale funding, and equity/capital funding. Retail funding is often drawn from transaction accounts, deposit accounts, public deposits, savings accounts, and current accounts. Wholesale funding can be drawn from borrowing funds based on secured and unsecured debt obligations, short-term high-grade securities sold on the basis of a repurchase agreement, as well as repo transactions and short-term debt instruments like promissory notes (Abbas & Ali, 2021).

Besides long-term collateralised loans and debt securities or covered bonds, other forms of deposits that reflect the different funding sources that the bank can use encompass certificates of deposit, brokered deposits as used in the US banking industry, deposits from other banks, money market deposits, parent company deposits, deposits from government entities, as well as support and grants from governments. Besides negotiating with the government for tax reductions, the bank can also raise funding through equity/capital funding sources like retained earnings, preferred stocks, and common stock (Adelopo et al., 2018). Even if these are the various funding sources that improve the diversification of the bank's funding sources, most studies still highlight that most contemporary banks still face the challenges of getting funding at the best affordable costs and creating a mix of short-, medium-, and long-term funding to improve the diversification of the bank's funding sources.

Besides the constraints of balancing assets with liabilities, it is also difficult for banks to create and maintain a cushion of highly liquid assets due to variations in daily circumstances (AlKhouri & Arouri, 2019). Due to the structural challenges that leave most banks vulnerable to new market shocks, there is also pressure from the new Basel III regulations that demand higher capital buffers and better liquidity ratios. As this puts pressure on the balance sheet of most banks, long-term secured funding has also declined just like the unsecured funding markets that have reduced access to cheap funding (Parameshwaran, 2023).

Risk-Based Management Approach

A risk-based management approach is part of the crisis management strategies for improving a bank's resilience to respond to all the unfolding turbulences (Lam, 2023). It is a proactive approach that improves the bank's capabilities to identify and respond to all the operational weaknesses that can undermine its effective response during a crisis. Crisis management deals with the identification and mitigation of the devastating effects of a major sudden event that can undermine a bank's performance for a very long period. In contrast, risk management deals with the analysis, identification and mitigation of minor destabilising events that affect a bank's performance but not to the magnitude of the devastating impacts of a crisis (Miklaszewska et al., 2021).

Despite the differences, most studies still reveal that effective risk management is part of the integral process for leveraging the effectiveness of the bank's crisis management system. This is because a bank crisis is often punctuated with a lot of risks, such as credit risks, liquidity risks, operational risks, insurance risks and market risks (Chockalingam et al., 2018). Effective identification and mitigation of all these risks during a crisis therefore require the utilisation of the five steps for effective bank risk management that encompass the analysis and identification of all bank risks, profiling the nature of the risks and the likely magnitude of their effects on a bank's performance, and the introduction of risk prevention or mitigation measures (Doko et al., 2021).

Periodic usage of such a process enables banking executives to develop a risk management culture that improves the bank's capabilities to effectively diagnose and respond to all risks and crises. During a liquidity crisis, banking executives must evaluate and identify risks arising from funding deficiencies as well as the increase in costs that may affect the availability of more wholesale funding. To understand the nature of the risks and their magnitude, banking executives must also evaluate the objectives and strategies being used for the designated funding sources as well as the capabilities of the bank to quickly raise the required funding (Harle et al., 2023).

If the bank is unable to raise the required funding, its major impediments must also be evaluated, identified and mitigated. Evaluation of the bank's capabilities to mitigate the liquidity crisis may also require an analysis of the extent to which it is integrated and networked with the financial market. This is because higher connectivity with the financial market leverages a bank's capabilities to easily raise funding from different sources in the event of a liquidity crisis. To further mitigate liquidity risks, such analysis also requires an assessment of whether the bank has the required liquidity reserve and stock of highly liquid assets that can be used to respond to a crisis before the utilisation of the contingency funding plan (Kedarya et al., 2023).

This requires an analysis of whether the bank has a sufficient repository of highly liquid assets, whether the bank has invested in the generation and accumulation of highly liquid assets, whether the liquid assets are used for all the required scenarios of vulnerabilities, and whether the cost of maintaining highly liquid assets is affordable or too high to affect the bank's profitability (Chaffai & Dietsch, 2015). Even if this risk-based management approach is critical for mitigating risks to bolster a bank's profitability and effective performance during a crisis, an integrative review of different studies also revealed the use of a contingency funding plan.

Contingency Funding Plan

A contingency funding plan is the funding strategy and actions introduced to deal with a crisis in the event that the available funding sources are exhausted or turn out to be insufficient due to the protracted nature of the crisis (White, 2023). A contingency funding plan requires the creation and preservation of funds that are not considered part of the reserve funds but as the contingency fund that can only be released in the event that all other options are exhausted to raise sufficient funds to deal with the crisis. A contingency funding plan is critical in leveraging a bank's effective performance during a crisis. Instead of closing some of its business units, a contingency funding plan enables the bank to inject more funds and leverage the continuity of the bank's business units that would have closed due to the protracted nature of the crisis (White, 2023).

In that process, the development and use of the contingency plan require the accomplishment of critical tasks encompassing the identification of plausible stress events, estimation of the severity levels, occurrence and duration of the identified stress events on the bank's funding structure, analysis of the potential and viable contingency funding sources and creation of the funding inventory, identification of the available funding sources according to the isolated stress scenarios, and the setting of an administrative structure and crisis management team (Schuchardt, 2023). Regarding the identification of plausible stress events, banking executives will have to

analyse the business risks and crises arising from the failures of business activities like market, credit, reputational, operational and strategic failures. Such analysis must be accompanied by the evaluation of how such failures affect the bank's ability to renew and replace maturing liabilities, fund asset growth, hold back unexpected large deposit withdrawals, and use off-balance sheet commitments (Bank of Tanzania, 2023).

As much as such changes are internal, banking executives must also analyse risks arising from external changes in the volatility of security prices, market disruption, and negative press reputation and press coverage. These must be accompanied by the assessment and estimation of the severity levels, occurrence and duration of the identified stress events on the bank's funding structure. It is through such analysis that banking executives are able to discern whether or not the engagement of the contingency fund is required (Bank of Tanzania, 2023).

Even if contingency funding is required or not required, banking executives must still evaluate the inventory of funding sources to discern whether adequate funding can be drawn from liquidity reserves, unencumbered liquid assets, secured and unsecured funding, central bank reserve assets' reduction plan, and the sale of unencumbered assets. These leverage a bank's capabilities to respond and mitigate the unfolding crisis to turn around its profitability and liquidity crisis (Soper, 2023).

In other words, from these findings, it is evident that a comprehensive strategy for mitigating bank crises and risks to bolster profitability and liquidity will require the maintenance of balanced portfolios of liquid assets. Besides liquidity ratio analysis, banks may also be required to use stress testing, asset-liability management (ALM), diversification of bank funding sources, a risk-based management approach and a contingency funding plan. Given a series of crises like the 2008 financial crisis, the Covid-19 devastating economic effects and the Russia-Ukraine war that induced an energy crisis, the overall findings of this study raise a lot of managerial implications for contemporary banking institutions and businesses.

MANAGERIAL IMPLICATIONS

Findings imply the adoption of the appropriate crisis management strategy is critical for a bank to thrive in the midst of the series of crises and risks that modern banking institutions face. In that context, it is suggested that, to thrive, contemporary banking institutions must adopt the Proactive Stress Testing Model in **Figure 2** to bolster the management and improvement of a bank's profitability and liquidity during the crisis.

The suggestion of such a model is attributable to the fact that, though most studies have examined and suggested different core strategies for managing and improving a bank's profitability and liquidity during the crisis, only a few attempt to offer a more comprehensive framework reflecting all the critical strategies for managing and improving a bank's profitability and liquidity during the crisis.

To fill such a gap, this study offers the Proactive Stress Testing Model in **Figure 2**. In the quest to manage and improve a bank's profitability and liquidity during the crisis, it is argued that banking executives must undertake a strategic bank operations analysis before, during, and after the crisis. Since the business terrain has become quite unpredictable, this is because, all the time, the bank must be prepared for any unexpected sudden events to occur.

In effect, whether or not risks/crises occur, stress testing entailing sensitivity and scenario stress testing must be periodically undertaken to prepare and improve the bank's resilience to withstand all the emerging discontinuities. Using mathematical and statistical modelling techniques like linear models, econometric models, Monte Carlo simulations, and other quantitative risk models, the banking executives must evaluate the impacts of a combination of various factors, such as the impacts of increasing non-performing loans, declining loan demands, and declining deposits. They must also assess the effects of the unfolding crisis on the increasing withdrawals and negative reputation of a bank's cash flows, capital levels, deposits, performance of the credit facilities, as well as the bank's profitability and liquidity during the crisis.

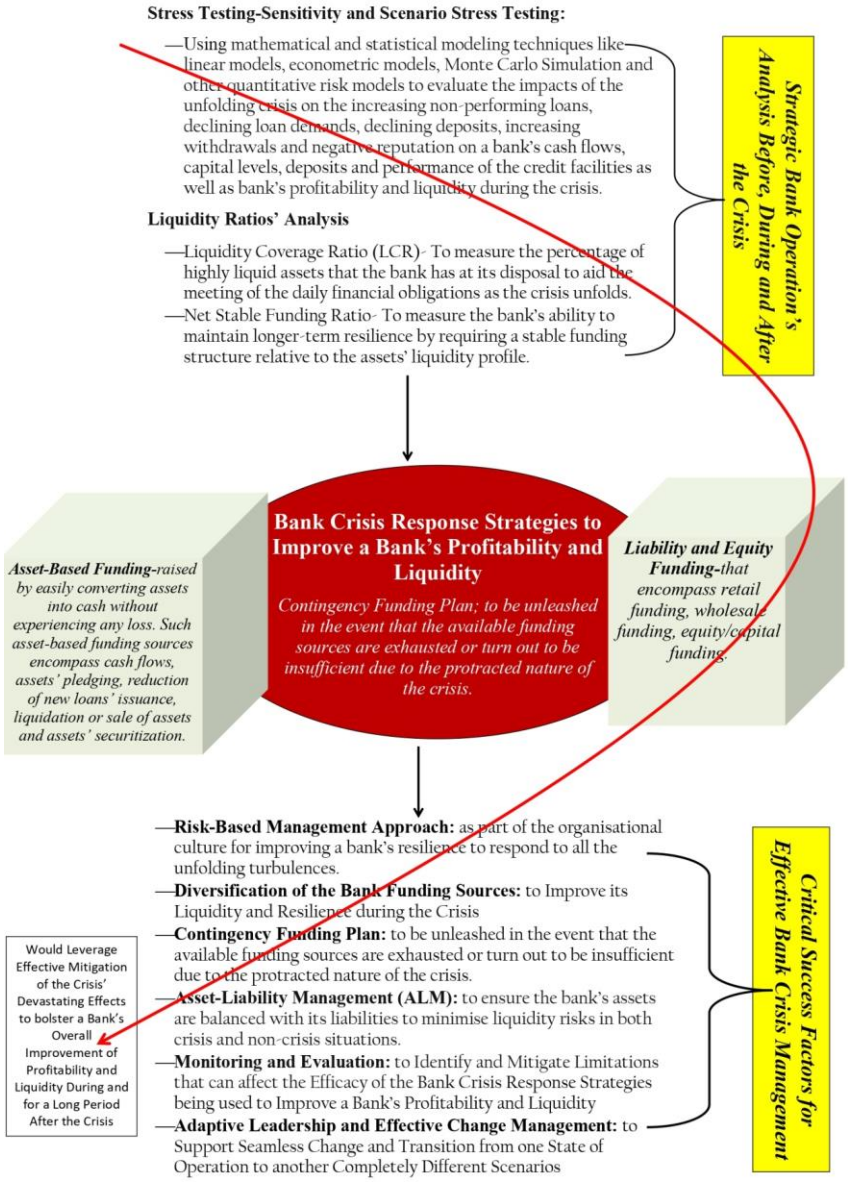

Figure 2. Proactive Stress Testing Model for Managing and Improving a Bank's Profitability and Liquidity During the Crisis

Though such analysis will inform the interventions that must be undertaken, the process of stress testing must also be accompanied by liquidity ratios' analysis. For the liquidity ratios' analysis to provide a comprehensive report about the impacts of the unfolding crisis on the bank's profitability and liquidity, banking executives must use the Liquidity Coverage Ratio (LCR) to measure the percentage of highly liquid assets that the bank has at its disposal to meet the daily financial obligations as the crisis unfolds. This must be accompanied by the use of the Net Stable Funding Ratio to measure the bank's ability to maintain longer-term resilience by requiring a stable funding structure relative to the assets' liquidity profile.

Once the impacts of the crisis on the bank's profitability and liquidity are well diagnosed, the bank crisis response strategies to improve a bank's profitability and liquidity may require the use of asset-based funding. Asset-based funding will enable banking executives to deal with liquidity-related crises by converting easily cash-convertible assets into cash without experiencing any loss. Such asset-based funding sources encompass cash flows, asset pledging, reduction of new loan issuance, liquidation or sale of assets, and asset securitisation. If the unfolding liquidity crisis cannot be addressed by the asset-based funding approach, then banking executives can adopt liability and equity funding, which encompasses retail funding, wholesale funding, and equity/capital funding. In the event that asset-based funding as well as liability and equity funding are depleted because of the protracted nature of the crisis, banking executives can engage the contingency funding plan.

The contingency funding plan can be unleashed in the event that the available funding sources are exhausted or turn out to be insufficient due to the protracted nature of the crisis. However, for these response strategies to be effective, as well as for the model in **Figure 2** to produce the desired outcomes, the critical success factors for effective bank crisis management that banking executives must consider encompass the use of a risk-based management approach as part of the organisational culture for improving a bank's resilience to respond to all the unfolding turbulences. Besides diversification of the banking funding sources to improve its liquidity and resilience during the crisis, banking executives must also use Asset-Liability Management (ALM) to ensure the bank's assets are balanced with its liabilities to minimise liquidity risks in both crisis and non-crisis situations. These must be accompanied by periodic monitoring and evaluation to identify and mitigate limitations that can affect the efficacy of the bank crisis response strategies being used to improve a bank's profitability and liquidity. In that process, banking executives must ensure that the bank leadership adopts the adaptive leadership approach. Adaptive leadership must be accompanied by effective change management to support the bank's seamless change and transition from one state of operation to other completely different scenarios. All these will leverage the effective mitigation of the crisis' devastating effects to bolster a bank's overall improvement of profitability and liquidity during and for a long period after the crisis.

CONCLUSION AND AREA FOR FUTURE RESEARCH

Even if there is no crisis, the outcomes of the integrative review imply banks' crisis management, aimed at managing and improving a bank's profitability and liquidity, must be part of the organisational culture. It must be part of the organisational culture that improves a bank's overall resilience and constant preparedness to respond and withstand all the unfolding disruptions and discontinuities. Unfortunately, with a gap arising from the lack of a comprehensive model for managing and improving a bank's profitability and liquidity during the crisis, most banks were still found to face the challenges of discerning how to do that more effectively and comprehensively whenever a crisis erupts. Nevertheless, through comparing, contrasting, linking, and integrating different authors' views, it was found that the strategies for improving a bank's profitability and liquidity during the crisis encompass liquidity ratios' analysis, stress testing, asset-liability management (ALM), diversification of a bank's funding sources, a risk-based management approach, and a contingency funding plan. Such findings imply that, if banks are to thrive in the midst of different economic shocks and discontinuities, they will have to adopt the suggested proactive stress testing model in **Figure 2** to effectively manage and improve the bank's profitability and liquidity during the crisis. But even if that is the case, the limitation of this study arises from the fact that the suggested model in **Figure 2** has not yet been scientifically tested to assess its validity and reliability. Hence, future studies can still use confirmatory factor analysis to test the validity of the model since its measuring constructs were just extracted using a qualitative approach. Future research could enhance the study by applying quantitative models, case studies, or real-world data to test the effectiveness of the proposed strategies. Additionally, exploring sector-specific variations in banking crises—such as differences between commercial and investment banks—could provide further depth to the discussion.

REFERENCES

Abbas, F., Ali, S., Yousaf, I., & Wong, W. K. (2022). Economics of risk-taking, risk-based capital and profitability: Empirical evidence of Islamic Banks. Asian Academy of Management Journal of Accounting and Finance, 18(1), 1–15.

Abbas, F., Iqbal, S., & Aziz, B. (2020). The role of bank liquidity and bank risk in determining bank capital: Empirical analysis of Asian banking industry. Review of Pacific Basin Financial Markets and Policies, 23(3), 205-225.

Abbas, F., Iqbal, S., Aziz, B., & Yang, Z. (2019). The impact of bank capital, bank liquidity and credit risk on profitability in postcrisis period: A comparative study of the US and Asia. Cogent Economics & Finance, 7(1), 1–18.

Abbas, F., & Ali, S. (2021). Dynamics of diversification and banks' risk-taking and stability: Empirical analysis of commercial banks. Managerial and Decision Economics, 43(4), 1–20.

Abebe, M.G. (2022). The effect of asset and liability management on the financial performance of microfinance institutions: Evidence from Sub-Saharan African region. Future Business Journal, 8, 29.

Adelopo, I., Lloydking, R., & Tauringana, V. (2018). Determinants of bank profitability before, during, and after the financial crisis. International Journal of Managerial Finance, 14(4), 378–398.

AlKhouri, R., & Arouri, H. (2019). The effect of diversification on risk and return in the banking sector. International Journal of Managerial Finance, 15(1), 100–128.

Anggono, H. (2017). The determinant factors of asset and liability management and the bank performance: Empirical study on foreign exchange commercial banks in Indonesia from 2008 to 2013. International Journal of Business and Globalisation, 19, 513–527.

Ardekani, A.M. (2023). Liquidity, interbank network topology, and bank capital. Review of Accounting and Finance, 23(9), 66-89. Emerald Publishing.

Allahrakha, M., Cetina, J., & Munyan, B. (2018). Do higher capital standards always reduce bank risk? The impact of the Basel leverage ratio on the U.S. triparty repo market. Journal of Financial Intermediation, 34, 3-16.

Aydemir, R., Zehra, A., & Bulent, G. (2023). Macro stress testing the credit risk of conventional and participation banks in Turkey: A nonparametric quantile regression approach. Eastern European Economics, 3(1), 42-73.

Agarwal, S., An, X., Cordell, L., & Roman, R.A. (2020). Bank stress test results and their impact on consumer credit markets. Working Paper 20-30, Federal Reserve Bank of Philadelphia.

Bank of Tanzania. (2023). Contingency planning guidelines for banks and financial institutions. Dar-Esalam: Bank of Tanzania.

Bassett, W.F., & Berrospide, J.M. (2018). The impact of post-stress test capital on bank lending. Working Paper 2018-097, Federal Reserve Board, Washington, D.C.

Barr, M.S. (2023). Multiple scenarios in stress testing. Boston, Massachusetts: Federal Reserve Bank of Boston.

Capponi, A., & Chen, P.-C. (2015). Systemic risk mitigation in financial networks. Journal of Economic Dynamics and Control, 58, 152-166.

Chaffai, M., & Dietsch, M. (2015). Modelling and measuring business risk and the resiliency of retail banks. Journal of Financial Stability, 16, 173–182.

Chockalingam, A., Dabadghao, S., & Soetekouw, R. (2018). Strategic risk, banks, and Basel III: Estimating economic capital requirements. The Journal of Risk Finance, 19(3), 225–246.

Cortés, K. R., Demyanyk, Y., Li, L., Loutskina, E., & Strahan, P. E. (2020). Stress tests and small business lending. Journal of Financial Economics, 136(1), 260–279.

Costa, A. C., Fulmer, C. A., & Anderson, N. R. (2018). Trust in work teams: An integrative review, multilevel model, and future directions. Journal of Organizational Behavior, 39(2), 169–184.

Cronin, M. A., & George, E. (2023). The why and how of the integrative review. Organizational Research Methods, 26(1), 168-192.

Doko, F., Kalajdziski, S., & Mishkovski, I. (2021). Credit risk model based on central bank credit registry data. Journal of Risk and Financial Management, 14, 138.

Durand, P. (2019). On the impact of capital and liquidity ratios on financial stability. EconomiX - UMR7235, Université Paris, Nanterre.

Gallardo, G.G., Schuermann, T., & Duane, M. (2016). Stress testing convergence. Journal of Risk Management in Financial Institutions, 9(1), 32–45.

Glasserman, P. (2023). Should bank stress tests be fair? New York: Columbia Business School.

Harle, A.H., Kremer, H.A., & Samandari, D.R.H. (2023). The future of bank risk management. London: McKinsey & Company.

Hopia, H., Latvala, E., & Liimatainen, L. (2016). Reviewing the methodology of an integrative review. Scandinavian Journal of Caring Sciences, 30(4), 662-669.

Kedarya, T., Elalouf, A., & Cohen, R.S. (2023). Calculating strategic risk in financial institutions. Global Journal of Flexible Systems Management, 24, 361–372.

Kunt, A. D., Pedraza, A., & Ortega, C. R. (2021). Banking sector performance during the COVID-19 crisis. Journal of Banking and Finance, 13(3), 1–22.

Lam, J.C. (2023). How banks can finally get risk management right. Boston: Harvard Business Review.

Manh, H.P., & Nguyen, N.M. (2023). Bank funding diversity, risk, and profitability: Evidence from Vietnam in the context of the COVID-19 pandemic. Cogent Business & Management, 10(1), 102-118.

Miklaszewska, E., Kil, K., & Idzik, M. (2021). How the COVID-19 pandemic affects bank risks and returns: Evidence from EU members in Central, Eastern, and Northern Europe. Risks, 9, 180.

Michelangeli, V., & Piersanti, F.M. (2023). Interdependence between assets and liabilities in the banking system: Changes in the last two decades. Finance Research Letters, 58(Part A), 49-77.

Miodrag, D. (2016). Stress testing tool in banking risk management – An evidence from Serbia. Economic Analysis, 49(3), 20-24.

Negash, D.W., & Veni, P. (2019). Impact of asset and liability management on profitability of selected commercial banks in Ethiopia. International Journal of Management, IT & Engineering, 9(5), 176–193.

Nisar, S.H., Peng, K., Wang, S., & Ashraf, B.N. (2018). The impact of revenue diversification on bank profitability and stability: Empirical evidence from South Asian countries. International Journal of Financial Studies, 6, 40.

Oermann, M.H., & Knafi, K.A. (2021). Strategies for completing a successful integrative review. London: Wiley & Sons.

Ogbeifuna, I.E., & Akinola, A.O. (2018). A comparative study of asset-liability management framework in the banking industry in Nigeria. International Journal of Governance and Development, 5, 98–103.

Onaolapo, A.A.-R., & Adegoke, K.A. (2020). Asset-liability management and performance of listed deposit money banks in Nigeria. Asian Journal of Economics, Finance and Management, 2(4), 40–58.

Owusu, F.B., & Alhassan, A.L. (2020). Asset-liability management and bank profitability: Statistical cost accounting analysis from an emerging market. International Journal of Finance and Economics, 26, 1–15.

Parameshwaran, S. (2023). How diversification helps banks lend more, cut risk, and boost the economy. Wharton: Wharton Business School.

Peykani, P., Sargolzaei, M., Botshekan, M.H., & Oprean-Stan, C. (2023). Takaloo, A. Optimization of asset and liability management of banks with minimum possible changes. Mathematics, 11(12), 27-61.

Schneider, T., Strahan, P., & Yang, J. (2023). Bank stress testing, human capital investment, and risk management. Working Paper 30867, Cambridge, Massachusetts: National Bureau of Economic Research.

Schuchardt, M. (2023). Under the spotlight: Liquidity and contingency funding plans. Washington, DC: Treliant.

Soper, L. (2023). How banks can manage liquidity risk in today's interest rate environment. New York: Wipfli.

Susanti, R.P., & Bahtiar, M.D. (2023). Banking performance before and during the COVID-19 pandemic: Perspectives from Indonesia. Cogent Economics & Finance, 11(1), 226-241.

Sutton, A., Clowes, M., Preston, L., & Booth, A. (2019). Meeting the review family: Exploring review types and associated information retrieval requirements. Health Information and Libraries Journal, 36(3), 202-222.

Tchuigoua, H.T., Durrieu, F., & Kouao, G.S. (2017). Funding strategy and performance of microfinance institutions: An exploratory study. Strategic Change, 26, 133–143.

Toronto, C.E. (2020). Overview of the integrative review. In: C. Toronto & R. Remington (Eds.), A Step-by-Step Guide to Conducting an Integrative Review, Cham: Springer, 1-9.

Veeramoothoo, S., & Shawkat, H. (2022). Impact of Basel III liquidity regulations on U.S. bank performance in different conditional profitability spectrums. The North American Journal of Economics and Finance, 63(1), 101-118.

Waweru, E., & Oribu, W. (2023). Assessing the impact of liquidity ratio requirements on the financial performance of commercial banks in Kenya. East African Journal of Business and Economics, 6(1), 203-210.

White, C. (2023). Managing liquidity risk and the importance of bank contingency funding plans. St. Louis: Federal Reserve Bank of St. Louis.

Xie, Z.H., Liu, X., Najam, H., Fu, Q., Abbas, J., Comite, U., Cismas, L.M., & Miculescu, A. (2022). Achieving financial sustainability through revenue diversification: A green pathway for financial institutions in Asia. Sustainability, 14, 3512.