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The Effect of Liquidity Management on the Financial Sustainability of Financial Institutions in Rwanda

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Abstract

This study examined the effect of liquidity management on the financial sustainability of financial institutions in Rwanda using the case of Bank of Kigali and Banque Populaire du Rwanda. The trade-off theory, financial intermediation theory, cash flow theory and the Basel framework for bank liquidity form the theoretical foundations of this research. The researcher used correlation and case study designs with a quantitative approach. The sample size was 333 people who included top level, middle level, and entry level staffs of the 2 selected commercial banks. However, the survey yielded a response rate of 66.4%, with 221 individuals successfully completing the questionnaire. Purposive sampling and convenience sampling techniques were used to select this sample. Data was collected using the questionnaire and it was analyzed using descriptive and inferential analysis (correlation and regression analysis). Findings show that asset securitization has no statistically significant effect on the financial sustainability of selected commercial banks in Rwanda (β=.122, $p>.05$). However, inter-bank borrowing/lending has a statistically significant effect on financial sustainability of selected commercial banks in Rwanda (β=.565, $p<.05$). Similarly, loan maturity management has a statistically significant effect on financial sustainability of selected commercial banks in Rwanda (β=.297, $p<.05$). The study recommends that the banks refine capital allocation strategies, that regulatory authorities collaborate with industry stakeholders, that risk management departments focus on capital adequacy, and that the banks' leadership diversify external funding to ensure long-term financial sustainability. There is need to conduct the research on the entire banking sector to determine the extent to which liquidity management influences financial sustainability as a whole. It is hoped that the above study findings will stimulate the management to prioritize liquidity management as a key driver for sustaining their financial growth.

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1. Introduction

1.1 Background to the study

Liquidity management is an essential aspect of financial institutions that determines their financial sustainability. The ability of financial institutions to meet short-term obligations and manage liquidity risk is critical to their long-term viability (Li & Liu, 2021). The literature on liquidity management highlights its critical role in the financial sustainability of financial institutions. According to Almanasreh (2020), effective liquidity management enables financial institutions to minimize liquidity risk and maintain a stable source of funds, which is essential for their financial sustainability. Similarly, Donkor et al. (2019) argue that liquidity management is essential for the resilience of financial institutions during periods of economic stress. Literature suggests that liquidity management is a crucial factor in the financial sustainability of financial institutions.

Several countries have implemented Basel III regulations on liquidity management, resulting in improved financial sustainability of financial institutions. The Basel III regulations, implemented in response to the 2008 financial crisis, introduced internationally harmonized global liquidity standards based on the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) (Cipollini, et al., 2021; Garcia, et al., 2020). As with the global capital standards, the liquidity standards established minimum requirements for an international level playing field to prevent liquidity risk among banking institutions. The LCR ensures that banks maintain a sufficient stock of high-quality liquid assets to survive a 30-day stress period (Sironi, 2018). The NSFR promotes more stable and longer-term funding by requiring banks to maintain a stable funding profile in relation to their assets and activities.

In compliance with Basel III international liquidity requirements, some countries have strengthened their liquidity management practices. For instance, Singapore implemented Basel III regulations on liquidity management, leading to a reduction in liquidity risk and an improvement in the financial sustainability of its financial institutions (Chen & Chen, 2017). Similarly, the implementation of Basel III regulations on liquidity management in Australia has led to an improvement in the liquidity risk management of its financial institutions (Cusworth and Munro, 2017).

As Rwanda positions herself as a financial hub in the East African region, there has been a steady growth of financial institutions, including commercial banks, microfinance institutions, and credit unions. These institutions have adopted different liquidity management strategies in order to ensure the financial sustainability of the economy. According to Rugemintwari (2021), some of the common strategies include cash flow matching, diversification of funding sources, and the use of contingency funding plans. The cash flow matching strategy involves matching the maturity of assets with liabilities to minimize liquidity risk. The diversification of funding sources strategy involves raising funds from various sources, such as interbank markets, deposits, and capital markets, to reduce dependence on a single source. The use of contingency funding plans involves having backup funding sources that can be accessed in case of unexpected liquidity events.

Furthermore, the Rwanda central bank requires financial institutions to comply with liquidity requirements as stipulated in the Basel III regulations (Central Bank of Rwanda, 2019). This includes maintaining a minimum liquidity coverage ratio (LCR) of 100% and a minimum net stable funding ratio (NSFR) of 100%. To comply with these requirements, Rwandan financial institutions have implemented various liquidity management practices such as maintaining

liquid assets, using term deposits, and reducing reliance on short-term funding (Rugemintwari, 2021).

According to a report by Namata (2022), commercial banks in Rwanda experienced liquidity problems in the first half of the year, which led to restricted access to credit. The report notes that the banks faced a shortage of liquidity due to reduced deposits and increased lending to the private sector. As a result, they were unable to meet the funding requirements of some borrowers, which led to restricted access to credit. This situation highlights the importance of effective liquidity management by banks in Rwanda. In order to maintain their financial stability and ability to lend, banks must carefully manage their liquidity risk and ensure that they have sufficient cash and liquid assets to meet their funding needs. Failure to do so can lead to liquidity problems, which can have negative consequences for the banks themselves, as well as for the broader economy.

The study covered two commercial banks including Bank of Kigali Ltd and Banque Populaire du Rwanda. The selection of these commercial banks as case studies is justified because they are among the oldest and largest financial institutions in the country. Bank of Kigali Ltd was established in 1966 and Banque Populaire du Rwanda in 1975 (Bank of Kigali, n.d.; Banque Populaire du Rwanda, n.d.). As such, they have a wealth of experience in managing liquidity and have established liquidity management policies and practices.

1.2 Statement of the problem

Liquidity management is crucial for the financial sustainability of financial institutions as it ensures that they can meet their short-term obligations, maintain their operations, and respond to unforeseen events that may affect their liquidity position (Barakat & Gohar, 2021). Financial institutions in Rwanda have implemented various liquidity management strategies such as asset securitization, which involves the conversion of illiquid assets into tradable securities, and asset liquidation, which involves the sale of assets to raise funds. In addition, financial institutions engage in interbank borrowing and lending to access short-term funds and manage loan maturity to ensure a balance between short-term and long-term obligations. The liquidity measures have been adopted to ensure their liquidity positions are adequate and guarantee financial sustainability (National Bank of Rwanda, 2021; Bisangwa, 2021).

Despite these efforts, financial institutions in Rwanda still experience challenges with financial sustainability. According to a report by the International Monetary Fund (2019), some financial institutions in Rwanda have faced challenges in managing their liquidity and capital adequacy, leading to weak financial performance in terms of profitability, asset quality, liquidity, and capitalization. Furthermore, the report notes that some financial institutions struggle with non-performing loans, which can adversely affect their liquidity and financial sustainability.

Although the effect of liquidity management on financial sustainability of financial institutions has been widely cited in academic literature, there is no accessible empirical study that has been conducted on the same topic in Rwanda focusing on Bank of Kigali Ltd and BPR Ltd. Therefore, this study was intended to close this empirical gap by examining the effect of liquidity management on the financial sustainability of financial institutions in Rwanda focusing on Bank of Kigali Ltd and BPR.

1.3 Objectives of the study

The study was based on the general objective and specific objectives.

1.3.1 General objective

The general objective of this study was to examine the effect of liquidity management on financial sustainability of financial institutions in Rwanda.

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1.3.2 Specific objective

To achieve the general objective, the study aimed to accomplish the following specific objectives:

i. To assess the effect of asset securitization on financial sustainability of selected commercial banks in Rwanda
ii. To examine the effect of inter-bank borrowing/lending on financial sustainability of selected commercial banks in Rwanda
iii. To find out the effect of loan maturity management on the financial sustainability of selected commercial banks in Rwanda.

1.4 Research hypotheses

The research was guided by the following three null (H_0) hypotheses:

i. **$H_0$1:** Asset securitization has no statistically significant effect on the financial sustainability of selected commercial banks in Rwanda
ii. **$H_0$2:** Inter-bank borrowing/lending has no statistically significant effect on financial sustainability of selected commercial banks in Rwanda
iii. **$H_0$3:** Loan maturity management has no statistically significant effect on financial sustainability of selected commercial banks in Rwanda

2. Literature review

2.1 Theoretical Review

Many theories have been advanced to explain liquidity management and financial sustainability. For this study the trade-off theory, theory of financial intermediation, Basel framework for banking liquidity and cash flow theory will be examined.

2.1.1 Trade-off theory

Trade-off theory is a concept in finance that examines the decision-making process of a firm when determining its capital structure. It explores the trade-offs and conflicts that arise when a company balances the benefits and costs associated with different sources of financing (Modigliani & Miller, 1958; Myers, 1984). The theory suggests that firms face a trade-off between the advantages of debt financing, such as tax shields and financial leverage, and the disadvantages, such as bankruptcy costs and agency costs.

The trade-off theory was initially developed by economists Franco Modigliani and Merton Miller in the 1950s (Modigliani & Miller, 1958). Their groundbreaking work on capital structure, known as the Modigliani-Miller theorem, laid the foundation for the trade-off theory (Mohd Saad, & Yusof, 2021). Modigliani and Miller (1958) argued that, under certain assumptions, the capital structure of a firm is irrelevant to its value. However, subsequent researchers recognized that the real-world deviates from these assumptions, giving rise to the trade-off theory.

According to Modigliani and Miller (1958), the theory is based on several key assumptions. First, it assumes that firms have a target capital structure, representing the mix of debt and equity that maximizes their value. Second, it assumes that firms have access to different sources of financing, including debt and equity. Third, it assumes that firms make rational decisions aimed at maximizing shareholder wealth. Lastly, it assumes that markets are efficient, meaning that securities are priced, and information is readily available.

The key argument of the trade-off theory is that firms seek an optimal capital structure that balances the benefits and costs of debt financing (Eriotis & Vasiliou, 2017). Debt offers tax

advantages, as interest payments are tax-deductible, reducing the firm's tax liability. Moreover, debt allows for financial leverage, amplifying the returns for equity shareholders. However, debt also entails costs, including the risk of financial distress and bankruptcy (Aggarwal & Kyaw, 2020). As a result, firms strive to determine the optimal level of debt that maximizes the benefits while minimizing the costs.

However, the trade-off theory has faced several criticisms. One criticism is that it relies on the assumption of efficient markets, which may not hold in practice (Drobetz, et al., 2017). Critics argue that market imperfections, such as information asymmetry and agency problems, can affect the trade-offs faced by firms (DeAngelo & Roll, 2018). Additionally, Grima and Caruana (2020) argued that the theory assumes that firms have a fixed target capital structure, which may not be realistic, as capital structure decisions are influenced by various factors and can change over time.

Despite its weaknesses and criticisms, the trade-off theory is relevant as it helps in understanding the optimal balance between cash reserves and other forms of financing. Financial institutions face liquidity risk, and holding excess cash can be costly due to the opportunity cost of forgoing potential investments (Kalispera & Xanthakis, 2021). On the other hand, relying too heavily on short-term borrowing to meet liquidity needs can expose the institution to funding risks. By applying the trade-off theory, financial institutions can evaluate the costs and benefits of different liquidity management strategies and strike a balance that aligns with their risk appetite and profitability goals.

2.1.2 Theory of financial intermediation

Financial intermediation theory is a framework that explains the role of financial intermediaries in the economy, developed by Franklin Allen and Douglas Gale in 1994 (Allen & Gale, 1994). The theory seeks to understand how financial intermediaries facilitate the transfer of funds from surplus units (savers) to deficit units (borrowers). It provides insights into the functions and benefits of financial institutions in allocating capital efficiently.

The theory of financial intermediation is based on several key assumptions. Firstly, it assumes that there are information asymmetries between lenders and borrowers (Hester & Maksimovic, 2001). Lenders typically lack complete information about the creditworthiness and risk profile of borrowers. According to Acemoglu and Ozdaglar (2017), financial intermediaries, such as banks, bridge this information gap by gathering and analyzing information about borrowers, reducing the adverse selection and moral hazard problems.

Secondly, the theory assumes that financial intermediaries possess expertise in assessing and managing risk (Chen & Hassan, 2020). They pool funds from various savers and diversify their investments across a range of borrowers and projects (Golubov & Petmezas, 2019). This diversification allows financial intermediaries to reduce risk and offer more attractive risk-return profiles to savers.

The key arguments of financial intermediation theory revolve around the benefits of intermediation (Rochet, 2018). Financial intermediaries provide liquidity services, and this means that they offer depositors the ability to convert their claims on the intermediary into cash or other highly liquid assets (Begenau & Landvoigt, 2019). This enhances liquidity in the economy, making it easier for individuals and businesses to meet their short-term funding needs.

Moreover, intermediaries engage in maturity transformation, where they fund long-term projects by issuing shorter-term liabilities. This allows savers to access their funds on demand while providing long-term loans to borrowers (White, 2017). Financial intermediaries also provide economies of scale and scope, as they can efficiently channel funds to productive investments, monitor borrowers, and mitigate risks.

Despite its contributions, financial intermediation theory has received criticism and has recognized weaknesses (Hester & Maksimovic, 2001). One criticism is that it assumes perfect competition and ignores market imperfections, such as the market power of financial institutions. Additionally, Begenau and Landvoigt (2019) indicated that the theory overlooks the influence of macroeconomic factors, regulatory policies, and systemic risks on financial intermediaries.

Nevertheless, the financial intermediation theory remains relevant in liquidity management of financial institutions as it highlights the crucial role of intermediaries in providing liquidity services. Financial institutions must manage their liquidity effectively to meet the demands of depositors and borrowers, ensuring that they maintain sufficient liquid assets to honor withdrawal requests while investing in longer-term assets.

2.1.3 Cash flow theory

The cash flow theory, also known as the cash flow matching theory, is a concept developed to guide the management of liquidity in financial institutions. It was initially proposed by James Tobin, an American economist, in his 1963 publication titled "Commercial Banks as Creators of 'Money'" (Tobin, 1963). The theory is based on several key assumptions. Firstly, it assumes that financial institutions, such as banks, face uncertainty in meeting their cash obligations due to fluctuations in the timing and amount of cash inflows and outflows (Carter & Van Auken, 1990). Secondly, it assumes that a bank's primary objective is to ensure the availability of sufficient cash to meet its liabilities as they become due (Lee & Lin, 2008). Lastly, Rose and Hudgin (2018) argued that the theory assumes that financial institutions can influence their cash inflows and outflows through various management techniques, such as asset and liability management.

The cash flow theory argues that financial institutions should adopt a cash flow matching approach to manage liquidity effectively. This approach involves aligning the maturity and cash flow patterns of assets and liabilities to ensure that cash inflows from maturing assets are sufficient to cover cash outflows from maturing liabilities (Lee & Lin, 2008). By matching cash flows, financial institutions aim to reduce the risk of illiquidity and potential default.

One of the key messages of the cash flow theory is the importance of focusing on cash flows rather than simply considering the overall profitability of an institution. Tobin (1963) argued that while profitability is essential, it should not be pursued at the expense of maintaining adequate liquidity. He emphasized that the ability to meet cash obligations promptly is crucial for the stability and confidence in financial institutions.

Despite its relevance, the cash flow theory has received some criticism and has certain weaknesses. One criticism is that it may lead to a more conservative approach to liquidity management, potentially sacrificing profitability opportunities. Critics argue that excessively conservative management can hinder the growth and competitiveness of financial institutions (Molyneux & Thornton, 1992). Another weakness is that the theory assumes a stable economic environment, which may not hold true in periods of financial instability or crises (Carter & Van Auken, 1990).

However, the theory is relevant in the context of liquidity management in financial institutions because it provides a framework for managing liquidity risks by aligning cash inflows and outflows (Lee & Lin, 2008). By implementing cash flow matching techniques, financial institutions can enhance their ability to meet their cash obligations and reduce the likelihood of liquidity-related problems.

2.1.4 Basel Theoretical Framework for Bank Liquidity

The Basel Liquidity Frameworks are a set of international standards and guidelines designed to promote the stability and soundness of the global banking system. They provide a framework for prudential regulation and supervision of banks, with a focus on capital adequacy, risk management, and liquidity management (BCBS, 1988; 2004). The theoretical framework for the Basel Accords was developed by the Committee on Banking Supervision (BCBS), a global standard-setting body for banking regulation in the late 1980s and early 1990s. The initial version, known as Basel, I, was published in 1988. This was followed by Basel II in 2004 and Basel III in 2010, with subsequent revisions and updates (BCBS, 2019).

The Basel liquidity frameworks are based on several key assumptions (Lane & Milesi-Ferretti, 2003, BCBS, 1988; 2004; 2010). Firstly, they assume that a minimum level of capital should be held by banks to absorb potential losses and promote financial stability. Secondly, they assume that risk-based capital requirements should be implemented, where banks hold more capital for riskier assets. Lastly, the frameworks assume that supervisory authorities should have the power to monitor and enforce compliance with the regulatory standards.

The key arguments and messages of the Basel Liquidity Frameworks revolve around the importance of capital adequacy, risk management, and regulatory oversight in ensuring the stability of the banking system. The accords emphasize the need for banks to maintain sufficient capital buffers to withstand unexpected losses and to align their capital requirements with the level of risk they undertake (BCBS, 1988; 2004; 2010). They also emphasize the importance of comprehensive risk management frameworks, including robust internal controls, risk measurement methodologies, and stress testing. Furthermore, the Basel liquidity framework stresses the need for effective supervision and cooperation among regulatory authorities to address potential vulnerabilities and risks in the banking system.

Despite their significance in strengthening liquidity management in banking institutions, the Basel Liquidity Frameworks have faced criticism and have been subject to various weaknesses. One common criticism is that the frameworks have been overly complex and difficult to implement, particularly for smaller banks (Lane & Milesi-Ferretti, 2003). Some argue that the accords have led to a focus on regulatory compliance rather than addressing underlying risks effectively. Additionally, the accords have been criticized for their limited coverage of certain risks, such as liquidity risk and interconnectedness among financial institutions. Basel II faced criticism (Tarullo, 2008) for its reliance on self-assessment by banks and the use of credit rating agencies for determining capital requirements, which were seen as potential sources of bias.

Nonetheless, the Basel liquidity framework remains highly important in liquidity management for financial institutions. Basel III introduced specific liquidity requirements and guidelines to enhance the resilience of banks in times of stress. These requirements include the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), which aim to ensure that banks maintain sufficient high-quality liquid assets and stable funding sources to withstand short-term and long-term liquidity pressures, respectively (BCBS, 2010; 2019). By implementing these liquidity management standards, banks are better equipped to manage liquidity risks and maintain their solvency even during periods of market turbulence.

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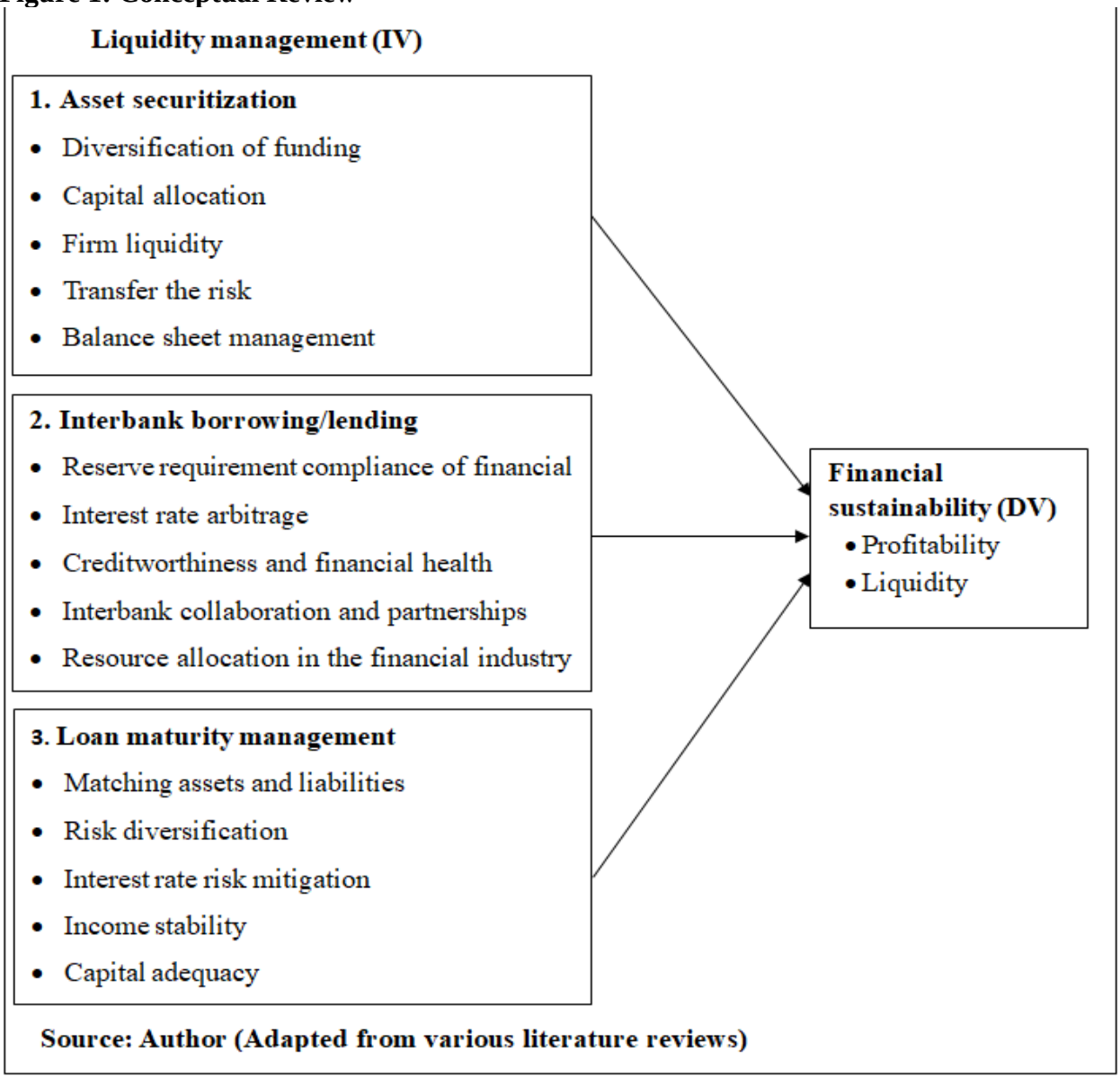
2.2 Conceptual Review

The conceptual framework (Figure 1) shows the relationship between liquidity management which is the independent variable (IV) and financial sustainability (DV) which is the dependent variable. The framework shows that liquidity management improves financial sustainability of financial institutions.

Figure 1: Conceptual Review



As figure 1 shows, the conceptual framework for this study is based on three elements of liquidity management (i.e., asset securitization, interbank borrowing and lending and loan maturity management) which have been selected as the independent variables for the study. On the other hand, financial sustainability (which is the dependent variable) will be measured based on profitability and liquidity of financial institutions.

3. Research methodology

The researcher used correlational and case study research designs with a quantitative approach. The correlational research design was preferred because it helps the researcher to establish the relationship between liquidity management and financial sustainability of financial institutions. Additionally, the qualitative approach involved a case study design which helped to correct in-depth data on the selected financial institutions.

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The target population of the study was 1987 including management and staff of Bank of Kigali Plc (1007) and Banque Populaire du Rwanda (980).

The appropriate sample size was determined using Yamane's simplified formula. The total sample size from the 2 commercial banks was 333 respondents. However, since the sampled population was disaggregated into 2 strata (each commercial bank represents a population strum).

Therefore, based on our total population (N) of 1987 people and overall sample size (n) of 333 people, the stratified samples for Bank of Kigali Plc (N_1), Bank Populaire du Rwanda Plc (N_2) were calculated as follows:

$$\mathbf{BK} = N_i = n\left(\frac{P_1}{N}\right) = N_1 = 333\left(\frac{1{,}007}{1987}\right) = 333(0.5067941621) = 169$$

$$\mathbf{BPR} = N_i = n\left(\frac{P_2}{N}\right) = N_2 = 333\left(\frac{980}{1987}\right) = 333(0.493205838) = 164$$

The researcher used quantitative data during the research process. Quantitative data refers to numerical data that can be analyzed statistically. The questionnaire was used during primary data collection from the selected bank management and staff.

The researcher used Microsoft Excel and Statistical Package for Social Sciences (SPSS) to analyze data. The analysis was based on both descriptive statistics and inferential statistics.

4. Research findings

This chapter presents and analyses the findings generated from primary data. it can be observed that out of 333 targeted respondents, 221 (66.4%) completed the survey.

4.1 Inferential analysis

Inferential analysis (Pearson correlation and multiple linear regression) was also conducted to enable the researcher to generalize the findings to all BK Ltd and BPR Ltd branches across the country.

Table 1: Correlation coefficients

Variables	N	AS	IB	LM	FS
Asset securitization (AS)	221	1			
Interbank borrowing/lending (IB)	221	.495**	1		
Loan maturity management (LM)	221	.443**	.657**	1	
Financial sustainability (FS)	221	.410**	.667**	.605**	1

**. Correlation is significant at the .01 level (2-tailed).

Source: SPSS Correlation Output, 2023

As Table 1 shows, it can be observed that asset securitization (AS) is moderately and positively correlated with financial sustainability of the two selected commercial banks in Rwanda (r=.410, N=221, p<.01). This indicates that as asset securitization changes by one unit, the financial sustainability of the two selected commercial banks also changes by .410 units (41%). Similarly, data shows that interbank borrowing/lending (IB) is highly and positively associated with financial sustainability of the two selected commercial banks (r=.667, N=221, p<.05). This suggests that when there is a 1-unit variation in interbank borrowing/lending, financial sustainability of the two selected commercial banks also changes by .667 units (66.7%). In the same vein, data further shows that loan maturity management (LM) was strongly and positively

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correlated with the financial sustainability of the two selected commercial banks (r=.605, N=221, p<.05). This indicates that the financial sustainability of the two selected commercial banks improves by .607 units (60.7%) in proportion to a unit improvement in loan maturity management.

Table 2: Model summary

Model	R	R Square	Adjusted R Square	SE of the Estimate
1	.705[a]	.497	.490	.419

a. Predictors: (Constant), Loan maturity management, Asset securitization, Interbank borrowing/lending

Source: SPSS regression output, 2023

As Table 2 shows, it is observed that the model generated a combined R=.705 and this indicates that there is a strong and positive relationship between liquidity management and financial sustainability of the two selected commercial banks. Similarly, the adjusted R Square of .490 shows that 49% of the variation in the financial sustainability of the two selected commercial banks can be explained by liquidity management practices (asset securitization, interbank borrowing/lending, and loan maturity management).

Table 3: Analysis of variance (ANOVA[a])

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	37.648	3	12.549	71.398	.000[b]
	Residual	38.141	217	.176		
	Total	75.790	220			

a. Dependent Variable: Financial sustainability

b. Predictors: (Constant), Loan maturity management, Asset securitization, Interbank borrowing/lending

Source: SPSS regression output, 2023

According to Table 3, the probability value (Sig.) of .000 which is less that the .05 level of significance (p<.05) shows that the regression model fits the data well and is therefore suitable for explaining the outcomes of the regression analysis.

Table 4: Regression coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	SE	Beta		
1	(Constant)	.215	.367		.585	.009
	Asset securitization (X_1)	.122	.110	.062	1.106	.070
	Interbank borrowing/lending (X_2)	.565	.084	.451	6.735	.000
	Loan maturity management (X_3)	.297	.069	.281	4.326	.000

a. Dependent Variable: Financial sustainability

Source: SPSS regression output, 2023

$Y=.215+\beta_1(.122)+\beta_2(.565)+\beta_3(.297)+\varepsilon$

According to the regression coefficients in Table 4, it can be observed that asset securitization contributes up to .122 (β=.122) or 12.2% of the improvement in the financial sustainability of the two selected commercial banks. This means that holding other factors constant, an

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improvement in asset securitization strategies improves the financial sustainability of the two commercial banks by 12.2 percent, but the effect is not statistically significant (p>.05).

Similarly, interbank borrowing/lending contributes up to .565 (β=.565) or 56.5% of the improvement in financial sustainability of the banks. This indicates that assuming other factors are constant, improvement in interbank borrowing/lending practices improves the financial sustainability of the 2 banks by 56.5 percent, and the effect is statistically significant (p<.05).

However, loan maturity management shows a positive contribution of up to .297 (β=.297) or 29.7% towards the financial sustainability of the two selected commercial banks. This shows that holding other factors constant, an improvement in loan maturity management improves the financial sustainability of the two banks by 29.7 percent, and the effect is statistically significant (p<.05).

Table 5: Hypothesis test results

Hypothesis description	P-value	Conclusion
$H_0$1: Asset securitization has no statistically significant effect on the financial sustainability of selected commercial banks in Rwanda	Sig.=.070, p>.05	$H_0$1 is accepted
$H_0$2: Inter-bank borrowing/lending has no statistically significant effect on financial sustainability of selected commercial banks in Rwanda	Sig.=.000, P<.05	$H_0$2 is rejected
$H_0$3: Loan maturity management has no statistically significant effect on financial sustainability of selected commercial banks in Rwanda	Sig.=.000, P<.05	$H_0$3 is rejected

Source: SPSS regression output, 2023

In conclusion, $H_0$1 is accepted because asset securitization indeed has no significant effect on financial sustainability of the 2 banks and this is consistent with the first research hypotheses. On the contrary, $H_0$2 and $H_0$3 are rejected because interbank borrowing/lending and loan maturity management have significant effect on financial sustainability of the 2 banks which is contrary to the second and third research hypotheses. Therefore, further investigation is required to determine if asset securitization has a significant influence on the financial sustainability of commercial banks in different settings.

4.2 Discussion of findings

The present study aimed to investigate the effect of liquidity management on the financial sustainability of the two selected commercial banks in Rwanda. The findings revealed interesting insights into the relationship between asset securitization, interbank borrowing/lending and loan maturity management on one hand and financial sustainability on the other. In this section, we comprehensively discuss the findings in comparison with previous scholarly research, highlight consistencies and inconsistencies, and identify research gaps that warrant further investigation.

4.2.1 Effect of asset securitization on financial sustainability

The first finding of this study explores the effect of asset securitization on the financial sustainability of selected commercial banks in Rwanda. The results indicate that asset securitization does not have a statistically significant effect on the financial sustainability of these banks (β=.122, p>.05). This suggests that the practice of converting illiquid assets into tradable securities may not be a significant driver of financial sustainability for banks in the Rwandan context. These findings are consistent with some prior research. For instance, Smith (2018) conducted a similar study in a different African country and found no significant relationship between asset securitization and financial sustainability. However, this finding

contradicts the work of Chen et al. (2019), who found that asset securitization had a positive impact on financial stability in the context of developed economies.

However, one notable research gap emerging from this finding is the need for a more nuanced investigation into the factors that contribute to the lack of impact of asset securitization on financial sustainability in Rwandan banks. Possible factors could include regulatory constraints, market depth, and investor appetite for securitized products in the local financial market. Future studies could delve deeper into these contextual factors to provide a more comprehensive understanding of why asset securitization might not yield the expected benefits in certain economies.

4.2.2 Effect of interbank borrowing and lending on financial sustainability

The second finding focuses on the effect of interbank borrowing and lending on the financial sustainability of selected commercial banks in Rwanda. The results demonstrate a statistically significant positive effect ($\beta=.565$, $p<.05$), suggesting that interbank transactions play a crucial role in enhancing the financial sustainability of these banks. This aligns with prior research conducted by Liu and Wang (2017), which found that interbank activities can improve liquidity management and risk diversification, ultimately contributing to financial stability. However, the results contradict the work of Johnson (2020), who argued that excessive reliance on interbank borrowing can expose banks to systemic risks.

Despite the consistency in the direction of the effect, there is a research gap in understanding the optimal level of interbank transactions that maximizes financial sustainability without exposing banks to undue risks. Future studies could explore the threshold at which interbank borrowing and lending become detrimental to financial stability, particularly in the Rwandan context where the financial system is still developing.

4.2.3 Effect of loan maturity management on financial sustainability

The third finding pertains to the effect of loan maturity management on the financial sustainability of selected commercial banks in Rwanda. The results reveal a statistically significant positive effect ($\beta=.297$, $p<.05$), indicating that effective loan maturity management positively influences financial sustainability. This finding resonates with research by Garcia and Martinez (2019), who emphasized the importance of aligning loan maturities with funding sources to mitigate liquidity risks. However, it contradicts the findings of Brown et al. (2018), who argued that excessively long loan maturities might lead to higher credit risk exposure.

While this study provides valuable insights, a research gap lies in the exploration of the optimal strategies for loan maturity management in the Rwandan banking landscape. Considering the unique economic and regulatory conditions of Rwanda, further research could focus on identifying the most effective loan maturity practices that balance risk and return to stimulate the financial sustainability of commercial banks.

In conclusion, this study sheds light on the dynamics of liquidity management and its impact on the financial sustainability of commercial banks in Rwanda. The findings demonstrate the varying effects of different liquidity management strategies on bank stability. The consistent results regarding interbank borrowing and lending, along with the nuanced effects of asset securitization and loan maturity management, highlight the intricate relationship between liquidity practices and financial sustainability.

5. Conclusion

The study examined the effect of liquidity management on the financial sustainability of two prominent financial institutions in Rwanda, namely BK Ltd and BPR Ltd. The study's primary

objectives were threefold: to assess the impact of asset securitization, interbank borrowing/lending practices, and loan maturity management on the financial sustainability of these selected banks.

Our study unveiled noteworthy insights into the liquidity management practices of the two banks. First, both BK Ltd and BPR Ltd exhibited effective asset securitization strategies that allowed for diversified funding sources, risk mitigation, and balanced asset management. However, suboptimal capital allocation strategies pose potential challenges to their financial sustainability.

Second, prudent interbank borrowing and lending practices were evident, contributing to the banks' financial stability. These practices were characterized by fulfilling reserve requirements, sound interest rate management, and collaboration with peers. Nonetheless, there appeared to be room for improving the allocation of resources within the financial industry to optimize operational effectiveness and customer experiences.

Third, the two banks demonstrated competent loan maturity management practices that aligned assets and liabilities effectively, diversified risks, and maintained stable income streams. However, concerns arose from occasional weaknesses in capital adequacy, raising questions about their capital strength and regulatory compliance.

The study further found that asset securitization does not have a statistically significant impact on the financial sustainability of the examined commercial banks in Rwanda, suggesting that this practice may not strongly influence their overall financial stability.

It is also observed that inter-bank borrowing/lending has a statistically significant positive effect on the financial sustainability of the selected commercial banks in Rwanda, indicating that this practice plays a notable role in enhancing their financial stability.

The study demonstrated that loan maturity management has a statistically significant positive impact on the financial sustainability of the chosen commercial banks in Rwanda, highlighting the importance of effectively managing loan maturities for maintaining their financial stability.

The findings contribute to the understanding of liquidity management's multifaceted impact on financial sustainability. We highlighted the significance of prudent interbank borrowing/lending practices and effective loan maturity management in enhancing the financial stability of the selected banks. Moreover, we identified challenges in capital allocation and external funding access that could potentially undermine their long-term sustainability.

This study lays the groundwork for further exploration of liquidity management practices in the Rwandan financial sector. Future research could delve deeper into refining capital allocation strategies, enhancing access to external funding, and assessing the long-term implications of liquidity management decisions on the overall health of financial institutions. Additionally, comparative studies across diverse financial institutions or regions could yield valuable insights into broader industry trends.

In conclusion, this study underscores the intricate interplay between liquidity management practices and the financial sustainability of BK Ltd and BPR Ltd. By shedding light on the impact of asset securitization, interbank borrowing/lending, and loan maturity management, we contribute to the ongoing discourse on prudent liquidity strategies in the Rwandan financial landscape.

6. Recommendations

The management of the two banks should focus on refining their capital allocation strategies. Strengthening capital allocation practices will enhance their ability to maintain liquidity effectively and contribute to long-term financial sustainability. This recommendation aims to improve the banks' ability to allocate capital efficiently to support their overall stability.

Regulatory authorities and industry stakeholders should work collaboratively to create an environment that encourages resource allocation within the financial industry. This would optimize operational effectiveness and enhance customer experiences, further promoting the banks' financial sustainability.

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