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Impact of Liquidity Risk Management on Profitability of Canadian Banks

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Abstract

This study analyzes the impact of liquidity management on the performance of banks in Canada. The Canadian economy is significantly reliant on the banking sector, which plays a vital role by offering financial services, including lending to corporate, commercial, and retail clients. The stability of the banking system is essential for the continuity of successful economic activities within the country. Strong liquidity ratios are indicative of financial stability and serve as a foundation for customer confidence. This study employs descriptive, correlation, and regression analyses and compares the liquidity and performance of Canadian banks during the period from 2022 to 2024, using financial data primarily obtained from banks' financial statements. The findings indicate that the relationship between liquidity and profitability is mixed, varying from positive, sometimes negative or insignificant according to the specific variables and factors considered in the analysis. In general, a stable liquidity position contributes to greater stakeholder confidence, improved business activity, and higher income and profitability. Regulatory authorities should maintain vigilant oversight of banks' liquidity metrics to safeguard financial stability. External influences such as ongoing tariff conflict with United States and unstable geopolitical conditions can significantly affect bank performance and erode customer confidence. To address such challenges, banks should maintain sufficient buffer assets to meet liquidity demands. Deposit runs, whether triggered internally or externally, can become unmanageable; therefore, a conservative liquidity approach is necessary to preserve customer trust. Complex and high-risk financial products must be rigorously monitored. Additionally, concentration risk should be managed such that banks diversify their exposure across different sectors of the economy, ensuring that under-performance in a single industry segment does not jeopardize the overall stability of the banking sector.

Keywords	Liquidity Risk, Banks Performance, Canada

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INTRODUCTION

Liquidity in the financial sector refers to the availability of capital that can be deployed for lending or investment purposes. In contemporary financial systems, where capital primarily originates from credit, the liquidity of banks is broadly defined as their ability to meet contractual obligations as they mature, while simultaneously maintaining the minimum liquidity thresholds prescribed by central banks or financial regulatory authorities (Ibe, 2013; Classens, 2014; Banerjee and Mio, 2015; Omri, 2022; Audi & Ali, 2023; Hasan & Sadat, 2023). The relationship between a bank's liquidity position and its profitability or performance is commonly assessed using several financial ratios. These include return on assets, which measures net income relative to total assets, although it does not factor in capital structure or leverage. Return on equity, defined as post-tax income divided by shareholder equity, provides another profitability measure. In terms of liquidity, the liquid assets ratio is often employed as a reliable indicator. Effective liquidity management is critically important for banks, a fact that became particularly evident during the global financial crisis of two thousand eight. The Canadian banking sector's resilience during the 2008 crisis demonstrates the importance of prudent liquidity management. That crisis underscored how quickly liquidity can disappear in times of stress. Banks must manage both idiosyncratic, or institution-specific, liquidity risks and broader systemic liquidity risks. Therefore, bank management bears the crucial responsibility of ensuring sufficient liquidity to meet customer demands, which may involve holding adequate reserves of cash or cash-equivalent assets. Despite the recognized importance of liquidity management, limited empirical evidence exists on its nuanced effects on profitability in the Canadian banking sector. (Wali, 2018; Wuave et al., 2020).

Banks must strike a delicate balance between maintaining adequate liquidity and maximizing profitability. This balance is shaped not only by regulatory mandates but also by each institution's risk appetite, which must remain within acceptable regulatory bounds (Hussain, 2018; Ibe, 2013). Some perspectives explain that stronger liquidity enables banks to extend more credit, thereby generating greater interest income and boosting profits. By selectively lending to financially stable borrowers, banks can also reduce the need for provisioning against credit losses. Moreover, solid liquidity positions allow institutions to seize investment opportunities, such as acquiring high-yield bonds, that can improve overall returns. However, stress events can arise from a broad range of internal or external sources, each capable of impacting financial performance. Internally, factors such as balance sheet structure, capital adequacy, and risk management policies, including credit risk assessments, play significant roles (Shahbaz, 2018; Adamgbo et al., 2019; Audi & Al Masri, 2024). Risk management is inherently embedded in banking operations, and the combination of inadequate liquidity and poor asset quality has historically been among the leading causes of bank failures globally (Guzel, 2021; Hun et al., 2024; Bozic & Bozic, 2025). Banks are essential institutions that play a pivotal role in the economic development of any country (Elliot, 2014; Singh et al., 2024). Canadian banks, as core facilitators of economic development, not only mobilize savings and provide credit, but also ensure the smooth functioning of financial markets. In the absence of a secure banking system, personal and institutional savings would remain idle and unproductive. Banks aggregate these scattered savings and channel them toward investment and productive economic ventures. By creating credit through lending,

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banks provide entrepreneurs with the capital necessary to expand operations and support individual borrowers with access to credit for home ownership and other personal needs. Banks also promote international and domestic trade by offering key financial services such as letters of credit and foreign exchange solutions, enabling businesses to engage in cross-border transactions with confidence (Kagunda, 2017; Ismail & Saeed, 2019; Iqbal & Abbas, 2024).

Liquidity management also involves complex calculations, estimates and use of models with increasing critical role of technology. Technological advancements have transformed banking operations, allowing individuals to access financial services through online platforms and mobile applications. This digital evolution has made banking more convenient, reduced transaction costs, and expanded access to underserved and remote communities (Khan, 2018; Kabir & Rashid, 2019; Wewege et al., 2020; Wadud, 2022; Raza & Khan, 2023). Banks now contribute significantly to both the economic and social dimensions of society by encouraging savings and investment, facilitating trade, stabilizing financial systems, generating employment, and promoting financial inclusion. In addition to their traditional functions, banks lead in financial innovation by designing and deploying modern financial technologies such as digital wallets, blockchain solutions, and artificial intelligence-based credit scoring systems. These innovations enhance operational efficiency, reduce fraud, and improve customer service experiences. As global economies become increasingly complex and interconnected, the importance of a resilient and inclusive banking sector continues to grow. Therefore, maintaining trust in banks, ensuring robust regulatory oversight, and fostering innovation are essential for achieving sustainable economic growth. Success stories from microfinance initiatives in underdeveloped countries demonstrate the banking sector's capacity to include previously marginalized populations in mainstream economic activity. Furthermore, banks are major employers, offering a wide range of career opportunities from clerical positions to senior executive roles. Given the high stakes of liquidity crises, understanding their impact on profitability is critical for regulators and managers alike. (Hassan, 2015; Sulehri, 2022).

During times of economic volatility, such as recessions or financial crises, banks play a stabilizing role. Central banks often provide liquidity support to ensure public confidence in the banking system (Buiter, 2014). In such times, banks may offer flexible loan terms or defer payments to ease financial pressures on borrowers. With adequate support from the banking sector, economic recovery can be achieved at a quicker pace. Liquidity management remains a central function of banking operations, ensuring that a bank can meet its short-term obligations without disruption. Effective liquidity risk management helps banks prevent panic scenarios and maintain continuous operational stability (Batrancea et al., 2021). Regulatory bodies, including central banks and financial supervisory agencies, mandate that banks adhere to specific liquidity standards. These standards require institutions to hold a minimum level of high-quality liquid assets to withstand short-term shocks and ensure long-term funding resilience. Complying with such regulations not only helps avoid penalties but also preserves the bank’s license to operate.

Trust is the cornerstone of any banking relationship. Clients must be confident that their funds are secure and accessible whenever needed. A perceived liquidity issue—even if unfounded—can trigger widespread withdrawals, quickly escalating into a full-blown crisis. Prudent liquidity management demonstrates a bank’s financial

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health and reassures both customers and investors, fostering trust and long-term loyalty (Bernanke et al., 2021). However, while holding significant liquid assets enhances safety, it can also reduce profitability, as these assets typically yield lower returns than loans or long-term investments. Therefore, efficient liquidity management is essential for optimizing fund utilization, identifying profitable investment opportunities, and maintaining a sound risk posture. During economic downturns or systemic financial shocks, the importance of liquidity becomes even more pronounced. Banks with strong liquidity frameworks are better positioned to absorb external shocks, continue lending operations, and support overall economic stability. Such banks can also respond more flexibly to evolving market conditions, adjust their strategies accordingly, and recover more effectively from disruptions. On a day-to-day basis, adequate liquidity ensures that banks can fulfill operational needs, such as processing withdrawals, executing fund transfers, and disbursing loans. A shortage of liquid assets can result in a liquidity crisis, even for otherwise solvent institutions (Chen et al., 2014). Such crises can disrupt banking services, erode public trust, and potentially lead to large-scale bank runs. Therefore, sound liquidity management is not merely a regulatory requirement, it is fundamental to the stability and resilience of modern banking institutions.

Effective liquidity management ensures that banks are able to meet their financial obligations, manage risk exposures, comply with regulatory standards, and support sustainable long-term growth. In a volatile financial environment, robust liquidity management is not merely a best practice but a vital necessity for the continued operation and survival of banking institutions. Historically, Canadian banks have maintained sufficient liquidity buffers and have exhibited a conservative approach to risk, particularly when compared to their southern neighbour. This conservative posture was evident during the global financial crisis of two thousand eight, when Canadian banks demonstrated resilience amid widespread instability. According to the Bank of Canada's Financial Stability Report, Canadian financial institutions have consistently maintained strong capital reserves, positioning them well to support the domestic economy. These banks are well-equipped to manage liquidity risks and navigate challenges associated with fluctuating markets and macroeconomic uncertainty. Over the past decade, the Canadian banking sector has demonstrated solid performance and has fulfilled its intermediary role between various classes of savers and borrowers, including commercial, corporate, and retail clients. Banks cater to the diverse needs of these customers, enabling the smooth transfer of financial assets, thereby generating returns for both investors and shareholders. Over time, banks have become indispensable to both economic systems and social well-being, with the stability of industries and communities increasingly reliant on the soundness of the banking sector.

Liquidity management plays a critical role in enabling banks to absorb shocks by ensuring that sufficient liquid assets are available to address unexpected withdrawals or disruptions in the financial markets (Omri, 2022). This capacity provides reassurance to depositors and investors, helping to prevent panic-driven responses and enhancing overall financial system stability. Sound liquidity practices at the institutional level contribute to the resilience of the wider banking sector, reducing the risk of contagion during times of economic crisis. While liquidity is crucial for maintaining financial safety and market confidence, excessive liquidity can impose significant costs on banks. Liquid assets typically yield lower returns

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compared to long-term loans and investments, thereby affecting overall profitability. As such, banks must continuously manage the trade-off between holding sufficient liquid assets for safety and maximizing returns through productive lending and investment activities (Gomes & Khan, 2011). The unique nature of banking operations—based on maturity transformation, where banks accept short-term deposits while extending long-term credit—makes liquidity management a central concern for solvency and continuity of operations.

Liquidity is generally categorized into two broad forms, funding liquidity and market liquidity. Funding liquidity refers to a bank's ability to settle obligations as they become due, while market liquidity pertains to the ability to sell financial assets quickly without significant loss in value (Gabilondo, 2016). Effective liquidity management ensures that both forms of liquidity are maintained at healthy levels, allowing banks to function effectively even during periods of financial distress. Efficient liquidity planning involves optimizing this balance by accurately forecasting cash flow requirements and managing the liquid asset portfolio with precision (Barnabas & Oloyede, 2024). Through this process, banks can minimize the opportunity costs associated with holding non-earning assets while maintaining financial stability. Strategic liquidity management also allows institutions to capitalize on investment opportunities that offer higher yields, without compromising their ability to meet immediate obligations. In this way, liquidity management is not solely a defensive mechanism; it is also a proactive strategy to enhance financial performance through prudent resource allocation. As key intermediaries in the financial system, banks channel funds from savers to borrowers, supporting economic development by financing business expansion, infrastructure development, and consumer spending. The effectiveness of this intermediary role is inherently dependent on consistent and efficient liquidity management. When banks manage liquidity well, they ensure the continuity of credit flows, uphold public confidence, and reinforce the resilience of the broader economy. Therefore, maintaining strong liquidity practices is essential not only for the internal stability of banking institutions but also for sustaining the economic momentum of the societies they serve. This study investigates: (1) the relationship between liquidity risk and profitability in Canadian banks, and (2) how asset quality and interbank exposures mediate this relationship.

LITERATURE REVIEW

Various theoretical frameworks assist in understanding the liquidity requirements of banks, including the shiftability theory and liquidity management theory. According to the shiftability theory, banks can maintain sufficient liquidity by holding assets that are easily marketable or convertible to cash, particularly during periods of financial stress. This theory emphasizes that liquid, marketable securities are dependable sources of liquidity that contribute to stability. In contrast, the liquidity management theory explains that banks do not necessarily need to maintain high levels of liquid assets because funding can be accessed through market operations. However, during financial crises, access to such funding becomes severely restricted, making asset-based liquidity indispensable (Nwankwo, 1991). Liquidity, fundamentally, is the ability to fulfill cash obligations as they arise. Both theories i.e., shiftability and liquidity management are relevant for Canadian banks as banks maintaining easily convertible asset and ability to meet obligation are key targets for the banks. (Valla et al., 2006). Many banks have invested in advanced risk management systems that help align expected cash inflows and outflows, thereby preventing potential cash shortages

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(Kumar and Yadav, 2013). External economic conditions also affect bank performance, including inflation, interest rate fluctuations, concentration risk, and the size of the banking industry. Commercial banks operating in competitive markets are generally more efficient in resource utilization (Almazari, 2014).

The shiftability theory also posits that liquidity is sufficient if a bank's assets can be sold or converted to cash under adverse market conditions. Additionally, it states that liquidity can be sourced from liabilities and underscores that marketable securities are among the most reliable instruments for maintaining liquidity (Wuave et al., 2020). Liquidity risk management, therefore, involves maintaining a balance between holding excess cash and ensuring that the bank has enough liquid assets to meet its obligations. Liquid assets generally include cash held by the bank and reserves maintained with the central bank. Compliance with reserve requirements is a key aspect of liquidity management and enables banks to meet their payment obligations. Banks execute clearing and settlement activities through their accounts at the central bank, and the treasury department of each bank is responsible for maintaining these balances to meet both clearing and reserve requirements consistently. Excessive cash holdings, while promoting safety, reduce profitability since idle cash does not earn returns. Thus, maintaining an optimal level of liquid assets is necessary to allow banks to invest funds and earn profits, which in turn enables them to pay interest to depositors and generate returns for shareholders. In summary, safety and profitability are inversely related as safe investments or low risk assets generate lesser profits.

Bank performance is assessed through various financial indicators, with profitability often measured by financial ratios such as return on equity. Return on equity is a key metric for investors, as it reflects the bank's ability to generate profits after tax using shareholder funds (Pointer & Khoi, 2019). A high return on equity supports greater dividend payments to shareholders. Return on assets is another profitability measure, reflecting the bank's efficiency in generating income from its total assets, although it does not account for differences in capital structure. Within the same national context, banks may adopt differing strategies, with some maintaining higher liquidity ratios and others choosing a more aggressive stance with lower ratios. Regardless of strategy, all banks must comply with the minimum liquidity requirements imposed by regulatory bodies or the central bank (Parameswar et al., 2012).

Historically, liquidity management did not receive the level of attention it now commands within the financial management discipline (Goodhart, 2009). In recent years, however, it has become one of the most critical areas, with banks dedicating considerable resources and effort toward managing liquidity risk effectively. Low liquidity levels may prevent banks from capitalizing on profitable opportunities in the market, thereby limiting their income-generating capacity. More critically, insufficient liquidity may hinder the bank's ability to meet maturing obligations and fulfill existing commitments, potentially forcing the liquidation of assets at distressed prices. Such conditions may lead to insolvency and the eventual discontinuation of operations. As emphasized by Wang (2002), effective liquidity management is not only vital for the success of individual banking institutions but also for the stability and resilience of the financial system as a whole.

Monetary policy implementation, including the pursuit of sustainable economic growth, has a critical component: liquidity management (Chugunov et al., 2021). For

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maintaining macroeconomic stability, liquidity management must provide resilience during periods of economic volatility. Central banks play a crucial role in ensuring financial stability during stress events. Their primary responsibility is to regulate liquidity across the financial system without waiting for individual banks to develop their own liquidity policies. Tools such as the discount window can be used effectively to provide short-term liquidity to banks, enabling them to meet their immediate liquidity requirements. Acting as financial intermediaries, banks collect funds from depositors and allocate these resources to individuals and businesses in need of liquidity (Adebayo, 2011). Mazur (2015) further notes that macroeconomic factors significantly influence liquidity within the financial sector.

In the modern economy, banks are indispensable institutions contributing to both economic stability and development. Central banks implement monetary policies through commercial banks, allowing targeted interventions in neglected sectors by encouraging lending and development. Banks raise funds from the general public, corporate clients, and commercial entities, subsequently offering credit and discounting bills. The ability of any organization to meet its current liabilities, such as taxes and interest obligations, depends on its liquidity position. Liquidity is essential for meeting these commitments. To maintain liquidity, banks often hold high-quality liquid assets, which yield lower returns. Thus, liquidity management involves a trade-off, as holding liquid assets ensures safety but may reduce profitability. In the context of commercial banking, liquidity refers to the ability to meet maturing obligations, including customer deposits, loan commitments, investment obligations, and other liabilities (Malik et al., 2016).

Liquidity, therefore, represents the bank's capacity to fund asset growth and honor liabilities as they come due. Effective liquidity management reflects a bank’s operational capability to meet cash payment obligations under normal and stressed conditions (Ruozi et al., 2013). External circumstances, which are often beyond the bank’s control, can significantly affect cash flows. Hence, liquidity management is central to a bank’s operational survival. However, excess liquidity is not a sign of optimal financial management. As liquid assets tend to offer low returns, holding surplus liquidity can impair a bank’s profitability. (Alshatti, 2015).

Banks play a vital role in absorbing excess liquidity from depositors and reallocating it to individuals or firms in need of funds for productive purposes, such as investment. This intermediation function exposes banks to risks and uncertainties, as they attempt to maximize returns on their lending activities while ensuring depositor funds are available when demanded. Despite the centrality of liquidity risk, prior empirical findings are inconsistent regarding its effect on bank performance. (Delis et al., 2014). Demand deposits can be withdrawn at any time, creating uncertainty. If a bank fails to meet these withdrawal requests, it risks triggering a crisis of confidence that could lead to a deposit run. Consequently, it is the responsibility of banks to maintain transparency in balancing liquidity requirements with the pursuit of profitability, ensuring that sufficient liquid resources are always available to meet obligations (Alshatti, 2015; De Haan and van den End, 2012). Bank performance evaluation refers to the process of assessing whether the institution has used its resources efficiently. Banks must prioritize operational areas that influence the trade-off between profitability and risk exposure. The aim is to achieve profitability while keeping liquidity risk within defined tolerance levels, ensuring continued operation and achievement of financial objectives. Liquidity management includes identifying,

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measuring, and monitoring liquidity risks, as well as maintaining contingency plans for potential stress scenarios. Banks often prepare maturity profiles and conduct asset-liability matching analyses to ensure adequate liquidity across various time horizons. In the event of a widespread stress situation triggered by external events, the entire banking sector may be affected (Alzorqan, 2014).

One of the core functions of financial institutions is to accept deposits, extend loans, and meet payment obligations. Liquidity risk is inherently present in these activities. This risk may arise due to mismatches between assets and liabilities, such as an increase in asset size without a proportional increase in liabilities, resulting in an inability to meet lending demands or fulfill obligations. Mismatches may also occur in the timing of cash inflows and outflows. During stress periods, whether caused by internal mismanagement or external economic shocks, such imbalances can lead to a liquidity shortfall. Failure to meet cash demands erodes public trust, damages a bank's reputation, and may ultimately result in insolvency or bankruptcy. Both developed and developing economies are vulnerable to these risks, highlighting their significance to banking operations (Holmström and Tirole, 1998; Bonfim and Kim, 2012; Gupta & Sivaprasad, 2021).

Research also shows that sound liquidity management can positively impact profitability. Adequate liquidity enhances depositor trust, which is especially critical in cash-based economies where deposit withdrawals may be frequent and unpredictable. In such contexts, depositors are highly sensitive to negative news related to a bank's liquidity. Furthermore, in hyperinflationary economies, capital growth may not always reflect profitability or operational stability. To address these challenges, banks must also invest in human capital. Building internal expertise and promoting knowledge sharing among skilled personnel can improve liquidity management practices. Central banks, too, have a role in enforcing effective liquidity policies through enhanced oversight, penalties, and compliance monitoring (Agbada and Osuji, 2013; Otekunrin et al., 2019). Other studies have also found that good liquidity practices correlate positively with performance indicators such as return on assets and return on equity (Wuave et al., 2020; Edem, 2017; Almazari, 2014). However, high financing costs incurred to maintain liquidity or secure funding sources can negatively affect profits (Hacini et al., 2021; Marozva, 2015). Liquid assets can improve bank profitability up to a certain threshold, beyond which excess liquidity may dampen returns. The relationship is also influenced by the business model of the bank and prevailing market conditions (Bodeleau & Graham, 2010). Additional research reveals that during periods of economic stress, liquidity risk becomes a major determinant of bond prices, more so than in normal market conditions (Acharya et al., 2013). Effective liquidity management enables banks to fund operational costs such as depositor payments and administrative expenses. Current liabilities are generally covered using current assets, which are typically in the form of cash or cash equivalents (Alshatti, 2015).

Alzorqan (2014) provided a detailed examination of the relationship between liquidity and bank performance, using return on assets and return on investment as performance metrics. The study found that the correlation between the current ratio and both return on assets and return on investment was negative. In contrast, the relationship between the loan-to-deposit ratio and performance indicators was positive. These findings explain that liquidity risk and performance are interlinked. Liquidity concerns introduce significant uncertainty into operations. Liquidity also signifies the

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availability of investable funds. Greater liquidity provides banks with more capital to deploy, especially when interest rates are low and funding is inexpensive. Furthermore, liquidity also denotes the ability to meet financial obligations using readily convertible assets. Adequate liquidity allows firms to avoid selling core assets at reduced value, thereby preventing insolvency and ensuring business continuity.

Some studies, such as that by Adusei (2015), have used net interest margin as a measure of financial performance. The results of this study indicated a statistically significant direct relationship between liquidity and bank performance. While the return on assets was found to have a negative effect on the liquid assets to deposits ratio, return on equity had a significant influence only on the same ratio. These findings help explain the contradictions in results reported by other studies. The outcomes of these analyses are heavily dependent on the specific liquidity and performance ratios selected. There is no universally accepted liquidity ratio, which contributes to the variation in results—some studies report positive correlations while others show negative or no significant relationships. Sulaiman & Khalid (2023) explains that approximately 35.8 percent and 27.8 percent of the variations in return on assets and return on equity, respectively, can be attributed to liquidity. This underscores the importance of liquidity not only to regulators but also to investors and depositors.

Despite a substantial body of work on bank liquidity and its relationship with financial performance, significant ambiguities and inconsistencies persist regarding the optimal level and composition of liquid assets that maximize both safety and profitability (Alzorqan, 2014; Adusei, 2015; Sulaiman & Khalid, 2023). Existing theories such as shiftability and liquidity management provide important conceptual foundations, yet empirical studies reveal that the actual impacts of liquidity strategies on performance indicators like return on equity and return on assets remain mixed and context-dependent (Wuave et al., 2020; Edem, 2017; Almazari, 2014; Hacini et al., 2021). The literature further points to divergent results based on the specific ratios and models employed, as well as the varying influence of external macroeconomic shocks, regulatory requirements, and internal risk management practices (Bodeleau & Graham, 2010; Marozva, 2015; Acharya et al., 2013). Notably, most studies are limited by their regional focus, period of analysis, or by treating liquidity and profitability as static relationships, without fully accounting for dynamic interactions during periods of financial stress or shifting market structures (Goodhart, 2009; Holmström and Tirole, 1998; Gupta & Sivaprasad, 2021). This highlights the need for updated empirical research that systematically examines how different liquidity management approaches affect commercial bank performance under varying economic and regulatory conditions, bridging the gap between theoretical models and real-world banking outcomes.

THEORETICAL MODEL

The relationship between liquidity and profitability in banking is central to both financial theory and practical risk management. Banks are required to maintain sufficient liquid assets to meet short-term obligations, but excessive liquidity may limit their ability to generate higher returns from long-term, less liquid assets (Bourke, 1989). The theoretical expectation, supported by prior literature, is that while adequate liquidity is vital for risk management and regulatory compliance, an overly conservative liquidity position may suppress profitability by forgoing higher-yield investment opportunities (Molyneux & Thornton, 1992; Ibe, 2013). Conversely,

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insufficient liquidity may expose banks to default risk, undermining both ROA and ROE. The balance between these dimensions is particularly important in the regional context of this study, where macroeconomic shocks are minimized, and internal bank management practices are the primary drivers of profitability. The current analysis, therefore, contributes to the ongoing debate about the optimal level of liquidity for profit maximization in banking, providing empirical evidence relevant for both scholars and practitioners. By focusing on a single region and excluding macroeconomic controls, the study isolates the direct impact of liquidity management on financial performance, advancing the understanding of risk-return trade-offs in the banking sector (Mwangi, 2012). The theoretical basis for analyzing this trade-off is rooted in the liquidity-profitability framework, which argues that optimal liquidity management is essential for bank stability and sustainable profit generation (Athanasoglou et al., 2008). In this study, liquidity ratios serve as the core independent variables, while bank profitability is captured by two standard measures, return on assets and return on equity. The models become as:

$$ROA_{it} = \beta_0 + \beta_1 LIQA1_{it} + \beta_2 LIQD2_{it} + \beta_3 BTA3 + \beta_4 LA4_{it} + \beta_5 AQ5_{it} + \varepsilon_{it}$$

$$ROE_{it} = \alpha_0 + \alpha_1 LIQA1_{it} + \alpha_2 LIQD2_{it} + \alpha_3 BTA3_{it} + \alpha_4 LA4_{it} + \alpha_5 AQ5_{it} + \varepsilon_{it}$$

- ROA - Return on Assets - Profit after tax / Total assets
- ROE - Return on Equity - Profit after tax / Total equity
- Liquidity Risk (LIQA) - Liquid Assets / Total Assets
- Liquidity Risk (LIQD) - Liquid Assets / Total Deposits
- Balance Due to Other Banks (BTA) - Balance Due to Other Banks / Total Assets
- Assets Quality (AQ) – Non-performing Loans / Total Advances

This study is based on the financial data of big five Canadian banks, listed on TSX (Toronto Stock Exchange) over the period of 2021 to 2023. These banks include the following and hold 70 to 80% of the total deposits and can be used as representative of the banking system. The other banks not included in this study hold only 20% to 30% of the deposits and this doesn't materially affect generalization of results:

1. RBC (Royal Bank of Canada)
2. TD Bank (Toronto-Dominion Bank)
3. BMO (Bank of Montreal)
4. Scotiabank (Bank of Nova Scotia)
5. CIBC (Canadian Imperial Bank of Commerce)

RESULTS AND DISCUSSION

The results of table 1 reveal that mean value for return on assets stands at 0.007, which explains that Canadian banks, on average, generate a post-tax profit of 0.7 percent per unit of assets, indicating efficient asset utilization in profit generation. The standard deviation of 0.002 demonstrates relatively low variability among the banks' asset profitability, while the range from 0.005 to 0.011 implies that even the least profitable banks manage to maintain a positive, though modest, level of efficiency. For return on equity, the mean value is 0.126, explaining that Canadian banks earn a return of 12.6 percent on their shareholders' equity, which points to solid shareholder value creation. The standard deviation for return on equity is 0.034, indicating slightly higher variability compared to asset returns, possibly reflecting differences in leverage, risk appetite, or capital structure among banks. The minimum value of 0.077 and the maximum of 0.180 reveal that even the lowest performing banks offer substantial returns on equity.

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Turning to liquidity risk indicators, the average ratio of Liquid Assets to Total Deposits (Liquid Assets / Total Deposits) is 0.376, with a standard deviation of 0.110. This ratio, ranging from 0.030 to 0.498, explains significant variation in how banks manage liquidity against deposit obligations, which can be attributed to differences in risk management strategies or depositor profiles. The mean ratio of liquid assets to total assets (liquid assets / total assets) is 0.256, with a relatively tight standard deviation of 0.030, and values ranging from 0.193 to 0.309. These statistics highlight that Canadian banks, on average, allocate about 25.6 percent of their assets in highly liquid form, underpinning a generally conservative approach to liquidity management. Conservative approach here means that usually Canadian banks maintain high level of liquid assets, considerably more than minimum regulatory requirements. The observed minimum and maximum values for both liquidity risk indicators explain that while some banks adopt a more aggressive liquidity posture, most adhere to regulatory and prudential norms.

Examining the balance due to other banks as a share of total assets (balance due to other banks / total assets), the mean value is 0.031, and the standard deviation is 0.012. The range, with a minimum of 0.016 and a maximum of 0.054, indicates that interbank balances comprise a small but non-negligible component of the banks' asset base, possibly reflecting active participation in interbank markets for liquidity management. Such engagement is vital in maintaining short-term funding and liquidity, especially in a highly interconnected financial system.

Finally, the assets quality measure, captured as non-performing loans to total advances (non-performing loans / total advances), shows a mean value of 0.007 and a very low standard deviation of 0.001. This reflects consistently high asset quality among Canadian banks, with non-performing loans comprising less than 1 percent of total advances across the sample. The narrow range, from 0.005 to 0.008, further reinforces the idea that Canadian banks have effective risk controls and credit screening practices in place. Overall, the descriptive statistics set the stage for subsequent regression analyses by confirming a solid baseline of profitability, liquidity, and asset quality, with manageable variability across the sample.

TABLE 1: DESCRIPTIVE STATISTICS

	ROA	ROE	LIQD	LIQA	BTA	AQ
Mean	0.007	0.126	0.376	0.256	0.031	0.007
Median	0.007	0.134	0.394	0.255	0.026	0.007
Max	0.011	0.180	0.498	0.309	0.054	0.008
Min	0.005	0.077	0.030	0.193	0.016	0.005
Std Deviation	0.002	0.034	0.110	0.030	0.012	0.001

The table 2 reveals a moderately positive correlation of 0.484 between Return on Assets and Return on Equity, explaining that banks generating higher profits relative to assets also tend to provide higher returns to shareholders. This relationship is expected, as profitability on assets often translates into profitability on equity, especially when leverage and capital structures are stable. Examining the association between liquidity risk indicators and profitability, the correlation between return on assets and liquid assets to total deposits is 0.183, while the correlation between return on equity and liquid assets to total deposits is 0.248. These positive but weak correlations indicate that banks holding a larger proportion of liquid assets against their deposit base may see marginal improvements in profitability, though the strength

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of this relationship is limited. Similarly, the correlation between return on assets and liquid assets to total assets is 0.017, and between return on equity and liquid assets to total assets is 0.075, both of which are very close to zero. The moderate positive correlation of 0.357 between the two liquidity ratios indicates that banks managing high liquidity relative to deposits also tend to hold higher liquidity relative to total assets.

Balance due to other banks to total assets exhibits negative correlations with both return on assets (-0.119) and return on equity (-0.041), explaining that greater interbank exposure does not contribute to improved profitability, and may even slightly detract from it. Additionally, its negative correlation with liquid assets to total assets (-0.431) hints that banks allocating more funds to other banks may be managing liquidity in alternative ways rather than simply holding liquid assets. For assets quality, the analysis shows moderate negative correlations with both return on assets (-0.395) and return on equity (-0.526), indicating that banks with higher levels of non-performing loans relative to advances generally experience lower profitability. The weak correlation between Assets quality and the liquidity risk indicators (0.159 for liquid assets to total deposits and -0.053 for liquid assets to total assets) further explains that liquidity management is not directly associated with non-performing loan ratios in this sample. The correlation between assets quality and balance due to other banks to total assets is 0.212, a small positive value, explaining a slight tendency for banks with more non-performing loans to engage more in interbank transactions, though this relationship is not strong. Overall, the correlation matrix indicates that while there are clear linkages among profitability, asset quality, and liquidity risk measures, these relationships are generally modest in strength, highlighting the multifaceted nature of bank performance.

TABLE 2: CORRELATION ANALYSIS

	ROA	ROE	LIQD	LIQA	BTA	AQ
ROA	1.000					
ROE	0.484	1.000				
LIQD	0.183	0.248	1.000			
LIQA	0.017	0.075	0.357	1.000		
BTA	-0.119	-0.041	-0.136	-0.431	1.000	
AQ	-0.395	-0.526	0.159	-0.053	0.212	1.000

The results of table 3 show that the coefficient for liquid assets to total assets is negative, but it is not statistically significant given the high p-value of 0.7002. This indicates that changes in the proportion of liquid assets relative to total assets have little to no measurable impact on asset profitability for Canadian banks in this sample. This finding supports previous literature which explains that, beyond a certain threshold, higher liquidity buffers may not enhance, and can sometimes even constrain, profitability due to opportunity costs associated with holding low-yielding liquid assets (Ibe, 2013; Raz et al., 2022). The coefficient for liquid assets to total deposits is positive, yet it is also statistically insignificant with a p-value of 0.3549. This weak positive association implies that increasing liquidity relative to deposit obligations does not result in a meaningful improvement in profitability. This echoes earlier research that found the relationship between liquidity and profitability is often non-linear and context-specific, depending on the overall risk environment and bank-specific liquidity needs (Gajamer, 2024; Chishamba, 2025).

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Asset quality, represented by the ratio of non-performing loans to total advances, has a negative coefficient. While this result is statistically insignificant at conventional levels (p-value of 0.1592), it explains that worsening asset quality (i.e., higher non-performing loans) is generally associated with lower profitability. This aligns with established theory and empirical research which consistently demonstrate that poor asset quality erodes bank earnings by increasing credit losses and reducing net interest margins (Adebayo, 2011). Balance due to other banks to total assets also has a negative coefficient, with an extremely high p-value of 0.8982, indicating no meaningful relationship with asset profitability in this context. This lack of significance could reflect the relatively minor role of interbank placements in overall bank profitability in the Canadian context, or that these placements are more relevant for short-term liquidity management than for long-term earnings generation (Mwangi, 2012). Overall, the results from table 3 demonstrate that for Canadian banks, liquidity risk management, as measured by liquid asset ratios, and other selected bank-specific characteristics such as asset quality and interbank balances, do not significantly drive profitability when using pooled ordinary least squares regression. This reinforces prior empirical observations that the profitability liquidity relationship can be weak or insignificant, particularly in mature, well-regulated banking systems where liquidity positions are managed within a narrow band due to regulatory requirements and prudent risk management practices (Adusei, 2015).

TABLE 3: POOLED OLS
DEPENDENT VARIABLE: ROA

	Coefficient	Std. Error	t-ratio	p-value
Const	0.0120494	0.00583807	2.064	0.0660
LIQA	−0.00737477	0.0186068	−0.3963	0.7002
LIQD	0.00457613	0.00471726	0.9701	0.3549
AQ	−0.710985	0.467450	−1.521	0.1592
BTA	−0.00586193	0.0446856	−0.1312	0.8982
Mean dependent var		0.006953		
Sum squared resid		0.000032		
R-squared		0.230567		
F(4, 10)		0.749145		
Log-likelihood		76.70604		
Schwarz criterion		−139.8718		
Rho		0.023393		

The results in table 4 present the liquid assets to total assets, the coefficient is negative and statistically insignificant, indicating that changes in the share of liquid assets in total assets do not have a measurable impact on return on equity for Canadian banks. The very high p-value of 0.8972 highlights the lack of a meaningful relationship, reinforcing the view that, in this context, excess liquidity does not benefit shareholders and may reflect the opportunity cost of holding low-yielding assets. This finding is in line with international studies explaining that stringent liquidity requirements may sometimes constrain profitability, particularly when returns on liquid holdings are low relative to other asset classes (Ibe, 2013). The coefficient for liquid assets to total deposits is positive, and while it is not statistically significant, its magnitude is larger than that observed for asset profitability, explaining a weak positive association between liquidity management relative to deposits and shareholder returns. However, the high p-value (0.1869) indicates the relationship is

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not robust. These results echo the notion that effective liquidity management may have some benefits for equity holders, but the impact is neither strong nor consistent across the sector (Almeida et al., 2014).

Asset quality, measured by non-performing loans to total advances, shows a large and statistically significant negative coefficient with a p-value of 0.0363. This finding highlights that higher levels of non-performing loans substantially reduce return on equity, confirming that poor asset quality is a key risk to bank profitability and shareholder value. This result is consistent with existing literature, which has repeatedly shown that credit risk, manifested through higher levels of problem loans—leads to increased loss provisions, reduced net income, and ultimately lower returns for bank owners (Adebayo, 2011). In the Canadian context, where overall asset quality is generally high, the negative impact is still pronounced, indicating the importance of rigorous credit risk management for sustaining strong equity returns. Balance due to other banks to total assets exhibits a positive but statistically insignificant coefficient, explaining that interbank balances have little influence on equity profitability in the Canadian banking sector. The lack of significance may reflect the relatively minor role of interbank placements in generating profits, as they are often used more for liquidity management than for core earnings generation (Mwangi, 2012). Overall, the results from table 4 emphasize that while liquidity management does not appear to have a significant direct impact on shareholder returns in the Canadian context, asset quality remains a fundamental determinant of equity profitability. The findings explain that prudent management of credit risk is essential for maintaining strong returns for bank shareholders, while liquidity management, at least as measured here does not exert a statistically significant influence. These insights contribute to the understanding that Canadian banks' robust risk management and regulatory standards are instrumental in shaping profitability outcomes.

TABLE 4: POOLED OLS
DEPENDENT VARIABLE: ROE

	Coefficient	Std. Error	t-ratio	p-value
const	0.213764	0.100912	2.118	0.0602
LIQA	−0.0426073	0.321622	−0.1325	0.8972
LIQD	0.115530	0.0815386	1.417	0.1869
AQ	−19.5261	8.07996	−2.417	0.0363
BTA	0.346257	0.772398	0.4483	0.6635
Mean dependent var		0.126433		
Sum squared resid		0.009489		
R-squared		0.407838		
F(4, 10)		1.721815		
Log-likelihood		33.95830		
Schwarz criterion		−54.37635		
Rho		−0.099134		

CONCLUSIONS AND RECOMMENDATION

This study finds no significant direct impact of liquidity risk measures on Canadian bank profitability, but asset quality exerts a strong negative effect. Our empirical assessment indicates a mixed association between profitability and several liquidity metrics, revealing both positive and negative patterns depending on the indicator employed. The statistical connection between selected explanatory variables and

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performance measures is generally weak, indicating that liquidity alone does not fully explain earnings variance. Nevertheless, prudent liquidity enlarges lending capacity, lifts interest revenue, and supports profit generation. Institutions with ample liquid reserves can be more selective when extending credit, thereby lowering expected credit losses. High-liquidity banks often report stronger profitability because stakeholders attach greater confidence to organisations viewed as stable. Depositors typically accept modest returns at such institutions rather than seek higher but riskier rates from less liquid rivals. A robust liquidity position also lets management capture investment opportunities like high-yield bonds. Some ratios, however, show a negative link and underscore the need to balance liquidity with income-statement goals. That balance is framed by regulation and shaped by individual risk appetite. Customers rarely remain with a bank whose weak liquidity casts doubt on its viability. While the hypothesized positive association between liquidity and profitability was not statistically significant, the negative effect of poor asset quality on returns was confirmed.

The study is limited by its focus on five large banks and a relatively short sample period. Canadian banks traditionally hold sizeable liquidity buffers and pursue conservative risk profiles. Their resilience during the two thousand eight crisis highlighted the merit of this stance. Successive Bank of Canada stability reports confirm that strong capital positions allow these banks to support domestic activity while managing market volatility. Because liquidity management influences the wider economy, it deserves sustained attention and resources. Sources of instability now range from internal governance lapses to external geopolitical shocks. Maintaining public confidence is a shared duty of bank leadership and supervisors. Guidelines must evolve with markets rather than remain static. Constraints on funding access or sharply higher costs can impair a bank’s ability to raise cash, and even rumours of strain may trigger withdrawals that overwhelm buffers. Banks should therefore maintain ratios comfortably above minima, monitor high-risk exposures, and diversify deposits and loans so sector-specific losses remain absorbable. Regular dialogue between executives and regulators should address emerging pressures, refine stress-test assumptions, and update contingency funding plans. Advances in real-time payments compress the window to respond to outflows, increasing the premium on precise liquidity forecasting. Investment in data analytics, early-warning dashboards, and interbank liquidity arrangements can further insulate the sector. Transparent public disclosure of liquidity profiles also enhances market discipline, helping stakeholders distinguish prudently managed institutions from those reliant on fragile funding models. Further research could examine the dynamic impact of liquidity shocks, or compare Canadian banks with those in other developed countries.

Central banks can reinforce these efforts by adjusting lender-of-last-resort facilities, calibrating collateral requirements, and encouraging development of secondary markets for liquid securities. Such measures reduce the fire-sale discount banks face when converting assets to cash, lowering the cost of holding liquidity. At the institutional level, board-approved liquidity risk frameworks should link daily treasury limits to forward-looking indicators such as funding concentration ratios, counter-party credit lines, and scenario-based stress horizons. Periodic simulations under adverse macroeconomic assumptions help quantify potential gaps and inform capital preservation strategies. The experience of Canadian banks shows that embedding liquidity metrics into incentive structures, rewarding stable funding

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profiles rather than short-term volume growth, can align managerial behaviour with safety. Moreover, fostering a culture of transparency around liquidity positions reinforces depositor trust, which is the first defence against destabilising runs. Ultimately, a dynamic, technology-enabled, governance-driven approach to liquidity management supports both profitability and financial resilience, ensuring banks remain capable of fulfilling their intermediary role even amid heightened uncertainty over time. Canadian banks should maintain prudent credit risk management practices, while regulators should focus on ensuring asset quality rather than increasing liquidity requirements further.

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