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Navigating liquidity management challenges in the era of digital banking in the United States

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Abstract

This article discusses how digital banking changes the liquidity management practices of banks in the United States by analyzing the challenges posed by digitization, real-time transactions, changing consumer expectations, regulatory pressures, and the competitive threat from fintech. The study conducts a systematic literature review, examining academic literature, industry reports, and regulatory frameworks to develop a comprehensive assessment of liquidity management in the digital banking era. The study found empirical evidence that digital banking, notwithstanding its improvements in transaction efficiency and customer experience, also carries substantial liquidity management risks like greater deposit volatility, increased vulnerability to liquidity shortages, and heightened challenges associated with meeting stringent regulatory requirements such as Basel III. The research also sheds light on some of the most effective technological solutions available for earlier identification of potential liquidity risks such as AI-driven liquidity forecasting, treasury management (TM) applications in real time, and blockchain system-based payment platforms. Moreover, the study recommended adaptive and policies that enable seamless collaboration, such as well-structured data-sharing protocols between conventional banks and fintech companies, that facilitate a liquidity-sharing economy in order to mitigate mismatches in the liquidity needs of different businesses.

Keywords: Liquidity Managment; Digital Banking; Financial Technology; Liquidity Risk Management; Basel III Regulations; Real-Time Transactions

1. Introduction

The recent technological advancements have rapidly transformed the financial services industry and introduced several opportunities along with risks that affect how banks handle liquidity which impacts financial system stability [1]. This has become a defining characteristic of modern banking. This paradigm shift is evidenced by the State of Retail Payments research by Forrester for the National Retail Federation which found that there is a 69% surge in contactless transactions since January 2020 (National Retail Federation, 2020). This is complemented by projections indicating a robust compound annual growth rate of 16.1% for the global digital payments market in 2021 [2]. The study further projects the global digital payments market to reach $9073.09 billion in 2025 [2].

Traditional banks have undergone fundamental changes as a result of the growth of financial technology startups and changing consumer expectations [3]. Bank operations have undergone considerable change because of this digital transformation which affects how banks handle their liquidity. This research thoroughly examines the main liquidity management issues experienced by U.S. banks in the wake of rising digital banking and suggests technology-based solutions, proposed policy guidelines and examines how that affects the stability of the financial services industry.

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Digital payment adoption in the United States experienced a notable rise according to a study by McKinsey which shows that it reached 82% in 2021 from 78% in the prior year and 72% in 2016 [4]. It is well-established by scholars that digitization will eventually take over the financial sphere and that digital transactions are crucial, however, researchers have not adequately investigated the impact on the operations of banks and the broader economy of developed countries. Thus, available studies that focus on the effect of digitalization on banking services, particularly liquidity management, are scarce. Although the existing body of research suggests that digital payment systems can boost bank service quality and drive economic development and GDP growth [5][6][7][8][9][10]. It can also have a detrimental impact on the liquidity management of banks. However, there is a gap in the literature on liquidity management challenges posed by the rise in digital banking which this study addresses.

2. Literature Review

2.1. Digital Banking in the U.S.

The American banking sector has experienced a major digital transformation due to the growth of fintech startups, increased consumer competence in the use of advanced technologies, and the pressure traditional banks face to provide innovative solutions to their customers [11]. The rapid rise in digital banking has provided several innovative services and delivery platforms that enhance customer experience such as mobile banking and online account opening together with personalized financial management applications. Thus, banks and other financial institutions now use technologically enhanced tools and platforms to deliver smart services in real-time. Moreover, the rise in digitalization in the financial sector globally also introduced healthy competition between fintech firms and traditional banks in the quest to provide quality services to customers [12][13][11]. The introduction of new technologies has transformed conventional banking and enhanced the customer service of most banks [12]. Digital banking adoption has further increased because the COVID-19 pandemic underscored the relevance of banking remotely [14]. Thus, the COVID-19 pandemic triggered a rapid increase in digital banking platforms and services among every U.S. age group.

2.2. Liquidity Management: An Overview

Liquidity management today utilizes advanced technology platforms and systems to monitor real-time transactions [13]. Digital banking operations have introduced additional challenges in liquidity management due to the Basel III requirements that were implemented (Basel III [15]. This is because banks in order to meet the requirement in the Basel III, need to establish tighter control of their liquidity positions through advanced systems which can handle quick and huge volumes of digital transactions and potentially rapid deposit withdrawals [16].

The management of liquidity represents an essential banking operation that ensures financial institutions maintain sufficient cash and liquid assets for covering short-term borrowings and maintaining investor and depositor trust [17][18]. Banks traditionally solve their liquidity challenges through reserves of cash, government bonds and interbank lending. The transition to digital banking has made liquidity management complex and more challenging since banks need to adjust their operations to address changing customer patterns, real-time payments and the introduction of non-traditional financial institutions and fintech firms that equally provide banking services to customers [19].

Proper liquidity management is the bedrock of organizational success and thus requires serious attention and management as it leads to stakeholder confidence. Organizations are therefore required to maintain a delicate balance in their liquidity positions not too much, not too little: otherwise, poor liquidity management can lead to cash flow problems, which in turn may culminate in business failure [20][21][22]. The truth about the basic aim of business is to maximize shareholder's wealth while the objective is linked to the complexity of the capital structure of the company which consists of its debt and equity indicative of borrowed capital and ownership resources [23][24].

An obligation refers to what a firm owes, its short and long-term debt obligations, the repayment of which depends mainly on sufficient liquidity assets. Here, liquidity makes use of a balance between the ability to liquidate an asset, and the value of the asset lost. However, holding liquid assets has an opportunity cost, that is the potential returns lost by pursuing more profitable investments. [25] show that the liquidity position of an underlying business determines the capital structure decisions for the company.

2.3. The Evolution of Liquidity Management Practices in the U.S.

According to [37] through their manual on liquidity and fund management, liquidity demonstrates a firm's ability to meet cash and collateral obligations effectively while simultaneously minimizing the cost of its operations. This is crucial in effective financial management and stability because organizations are able to honor their financial obligations and avoid unnecessary expenses and disruptions of their normal operations.

Maintaining sufficient liquidity acts as a crucial safeguard that helps financial institutions handle predictable and unpredictable cash withdrawals and collateral needs while keeping operations stable and overall financial position sound. Financial institutions use this important metric to achieve three key roles that include handling customer withdrawals, adapting to balance sheet fluctuations and supporting the growth initiatives of customers by providing the necessary financial backing.

The 2008 financial crisis demonstrated severe flaws in how U.S. banking institutions handled the issue of liquidity risk management. As a result, the U.S. financial regulatory framework through the [29] has fundamentally reset the liquidity standards that applied to banks that operated at the national and international levels. Basel III introduced a complete set of liquidity risk management standards which differed from previous Basel Accords that mainly focused on capital adequacy 1988 & 2004.

The updated regulatory model established two essential liquidity ratio obligations consisting of the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). According to the LCR, all banks must hold liquid assets that can endure 30 days of possible cash withdrawals in the event of a financial crisis. Banks must adhere to the NSFR requirement by maintaining stable funding for their loans with extended terms as well as proving the resilience of these funds during market instability. The NSFR ensures that banks maintain stable funding sources which enable them to fulfill their long-term and medium-term loan portfolios from volatile market conditions.

The liquidity standards found backing in [27] framework which analyzes bank liquidity management. This comprehensive approach remedies three key aspects including maintaining liquid asset reserve to help withstand and absorb short-term liquidity requirements while implementing stable deposit systems that cushion against unpredictable withdrawals and strengthening equity funding which is an indication of long-term stability.

Liquidity management plays a central role in U.S. financial operations by adapting to various economic demands and threats that affect both financial institutions and the larger economy. U.S. financial institutions adopt liquidity management strategies that consist of building strong cash reserves and liquid assets which guarantee the prompt fulfillment of financial obligations [26][28]. Such measures focus on reducing potential cash flow interruptions as well as maintaining uninterrupted business operations. The complexities in the financial industry, due to advancements in technology through digital banking demand robust liquidity management mechanisms to handle emerging difficulties.

One major trend in liquidity management is the focus on forward-looking cash flow forecasting and monitoring. As a result, financial institutions have worked to enhance their capacity to forecast and manage fluctuations in cash inflows and outflows, which enables them to manage their liquidity positions more effectively and reduce the risk associated with liquidity shortfalls. This has included the adoption of more complex liquidity forecasting models, and advanced data analytics to better recognize cash trends and patterns.

The emphasis has not just been on cash flow management but also bringing a greater focus on diversifying funding and managing the maturity profiles. Financial institutions have also become increasingly reliant on diverse funding sources, including short-term borrowing, long-term debt, and equity financing, to enhance their liquidity toughness and minimize exposure to individual funding channels.

The need for a more integrated, system-wide approach to liquidity management has also become more pressing, as financial markets become increasingly complex and interconnected and the global economy increasingly interconnected. To address these issues, regulatory bodies from the financial sector have introduced monitoring frameworks, guidelines and standards on liquidity risk that promote more consistent and robust liquidity risk management practices across the financial sector [29][30].

Additionally, the way liquidity management practices have developed in the U.S. has been informed by lessons from past financial crises. The importance of liquidity has been a persistent theme in financial crises; for instance, the liquidity challenges faced by financial institutions in the 2008 financial crisis have driven a renewed focus on the importance of maintaining adequate liquidity buffers and then on strengthening the overall resilience of the financial system [30][31].

Conceptually, as the financial landscape continues to evolve, the management of liquidity will undoubtedly remain a significant concern for financial institutions and policymakers in the U.S.

2.4. Key Challenges in Liquidity Management in the Era of Digital Banking

The move to electronic banking has brought new difficulties in managing liquidity. Indeed, the availability of digital banking platforms has allowed consumers to easily transfer funds held across different accounts, thus limiting the stability of traditional sources of deposits [32]. Stable core deposits, like savings and checking accounts, used to be the traditional source of funding for banks, but they have been declining, making it harder for banks to forecast and manage their liquidity needs. Instead, banks have relied more on volatile sources of funding, which are vulnerable to market reactions and liquidity shortages [32] like wholesale markets and short-term borrowings.

In addition, the rise of fintech companies in the payment landscape has also led to another layer of complexity, where these new players influence funds movement and challenge traditional liquidity management practices. Fintech startups provide new types of digital banking services that could lead to liquidity shortfalls in traditional banks [13].

The emergence of digital banking sector has left financial institutions vulnerable to face higher risk levels of cyber-attacks that disrupt liquidity and operational continuity. Technological developments like real-time payments and digital cash management tools have led to a drastic shift in the environment where banks need to improve their liquidity monitoring and optimization capabilities to keep up with the pace of change.

Moreover, the regulatory environment has also become more stringent, such as the Basel III reforms, which require higher levels of capital and liquidity, further exacerbating the challenges for banks in the digital age. This comprised the introduction of the Basel III liquid ratios [29]. While these regulations are designed to enhance the robustness of the banking sector, they can also impose further restrictions on the liquidity management options available to banks. Numerous real-world scenarios and case studies have been reported in literature discussing liquidity management challenges in the digital banking age [32][33][15].

In addition to this pressure, banks also need to adapt to a changing customer environment. With Just-In-Time infrastructure capitalizing on the concept of liquidity, this poses an increasing challenge of immediate access to funds that can drive problems for any organization including banks as customers today expect seamless and on-demand access to their funds, thus requiring a shift in liquidity management from banks [12].

Moreover, banks are also dealing with changing customer preferences and expectations. The traditional banking model will have to evolve as customers expect seamless, on-demand access to their funds. Though digital banking provides certain challenges, it also introduces opportunities for banks to improve their liquidity management practices. Through the use of advanced analytics, automation, and a culture of innovation, banks can improve their modeling of liquidity needs and better manage liquidity risk, leading to increased financial resilience.

A study on European banks emphasizes the view of liquidity risk as directly affecting bank profitability, which calls for good liquidity management [33]. This emphasizes the need for robust liquidity management frameworks that adapt to rapidly changing market conditions and customer preferences in the digital era.

2.5. Technological Solutions and Innovations in Liquidity Management

Liquidity risk can become a major threat to many businesses in the United States if funds are not effectively managed. To confront these liquidity management challenges, new capital market products and innovative strategies have emerged that leverage a more fluid perspective on balance sheet liquidity [34].

It is very important to distinguish between liquidity and solvency as the concepts are often used interchangeably in some contexts. Liquidity is the extent to which the firm can manage its cash outflows in a timely and cost-effective manner whereas solvency is the relative ability of the firm to settle its obligations over the long term [30]. Sound liquidity risk management is relevant for banks because they are especially exposed to liquidity risk because the maturity transformation provided by way of financing is rather in the form of long-term loans which is at variance with the short-term deposits which are usually the source of funding for such loans [30].

The Basel Committee on Banking Supervision has initiated several efforts to standardize institutions' and jurisdictions' approach to liquidity risk management and has issued several guidelines regarding its management and regulation [29]. Nevertheless, progress on that front has been slight, as the Committee has found it challenging to establish a uniform methodology and encourage banks to better monitor their liquidity risk [34].

Several technological solutions and innovations have been developed in response to these challenges to improve liquidity management [30]. In particular, analytical tools, as well as modeling techniques (for example, intraday liquidity

modeling using statistical methods), allow banks to achieve a degree of granularity and flexibility with respect to understanding their liquidity position [34]. Firms are better able to manage liquidity risk through innovations in capital market products and strategies.

Moreover, as the digital banking era challenges traditional liquidity management functions, banks have begun adopting a range of technological solutions and innovations. This involves leveraging machine learning and AI in enhancing liquidity forecasting and optimization, deployment of real-time payment and cash management systems and integration and supplanting of data analytics tools for better customer behavior and liquidity pattern insights. Some banks have advanced liquidity planning and scenario analysis tools based on machine learning algorithms designed to predict cash flow and liquidity needs using past data and market trends.

Additionally, the adoption of blockchain-based payment systems and digital currencies has the potential to improve the speed and transparency of fund transfers, thereby enhancing liquidity visibility and management.

2.6. Real-Time Transaction Processing and Its Implications on Liquidity Management

In the modern, constantly innovating field of digital banking, the capacity to execute transactions in real-time has emerged as one of financial institutions' most crucial liquidity management features. Real-time transaction processing involves the immediate processing of financial transactions, allowing real-time visibility into account balances, cash flows, and liquidity status [35]. Advanced technology has significant repercussions for financial institutions, firms, and customers, altering the manner in which liquidity is handled in the advent of digital banking.

Real time transaction processing is a beneficial tool for increased visibility and control around liquidity. Financial institutions need to estimate liquidity requirements to support real-time transactions and minimize any liquidity shortfalls that could occur. As customer demand evolves to expect real-time payments and immediate transaction settlement, banks are forced to implement more progressive liquidity management methodologies to accommodate demand whilst preserving capital stability [36]. With the advent of online banking platforms, the demand for efficient liquidity allocation and management has increased as customers choose mobile banking, digital wallets, contactless, or tap payments for their financial operations.

With traditional liquidity management practices taking a hit due to the rapid changes in technology, there is an increased reliance of individuals and businesses on digital transaction platforms. FinTech innovations are putting in place new financial solutions, which not only improve the efficiency of banks' operations but also provide customers with faster and more flexible access to funds. These trends require sound liquidity management systems that can enable instantaneous settlement, transaction monitoring, and risk mitigation in an environment where predicting cash comes on the heels of more difficulty than ever [36].

As discussed in existing studies, this shift towards real-time financial services has transformed the way banks manage liquidity. In digital banking, key challenges include ensuring enough liquidity for real-time payments, optimizing cash reserves, and balancing regulatory compliance requirements. The ability to link real-time transaction processing capabilities with liquidity management systems has significantly supported financial institutions in improving their cash flow forecasting capabilities, optimizing fund allocation, and reducing liquidity risks caused by high transaction volume and/or unforeseen payment flows [36].

This real-time transaction processing and its inherent customer convenience create numerous challenges for banks in the U.S., particularly in liquidity management and other backend operational risks. By the nature of real-time fund transfer, banks must keep larger liquidity reserves which put pressure on cash flow optimization and resource allocation. Moreover, risks of fraudulent activity are greater, as near real-time processing does not allow for enough time to identify and stop questionable transactions. This also puts pressure on the banking infrastructure which requires constant upgrades to handle high transaction volumes. In addition, traditional banks face a threat from FinTech competitors utilizing real-time processing forces expensive technology adaptations by traditional banks to remain relevant.

2.7. Key Regulatory Changes Affecting Liquidity Management in the U.S.

The 2008 financial crisis prompted the regulatory agencies in the United States to implement far-reaching and wide-ranging reforms to enhance the robustness of the financial system and curb the risks of liquidity mismanagement [37]. The two major changes to the regulatory landscape in this space include Basel III and the Dodd-Frank Wall Street Reform and Consumer Protection Act.

The Basel III [29] introduced minimum liquidity coverage and net stable funding ratios aimed at ensuring sufficient levels of high-quality liquid assets and stable funding sources for institutions to survive adequate stresses of the markets [29]. The Liquidity Coverage Ratio (LCR) is an important element of the Basel III liquidity framework, and it requires banks to maintain an adequate stock of unencumbered high-quality liquid assets that are readily available to meet the liquidity needs of a bank in the 30-calendar-day liquidity stress scenario. The goal of the NSFR is to incentivize longer-term structural liquidity by ensuring that banks maintain a stable funding source to cover their activities over a one-year horizon [38].

Passed in 2010, the Dodd-Frank Act includes several provisions that were also aimed at liquidity risk management. It gave the Federal Reserve the power to set stronger standards for large banks and systemically important financial institutions, for things like liquidity and stress testing. Furthermore, the Act contains provisions aimed at reforming the shadow banking system, which played a significant role in the 2008 crisis, by imposing greater scrutiny and regulatory standards on some non-bank financial firms [38].

The liquidity management of banks is heavily impacted by these regulatory changes. Particularly important changes include: having more high-quality liquid assets, diversifying their funding sources, and better internal liquidity risk management.

Although the real-world effectiveness of these reforms has been the subject of sustained debate, researchers agree that the financial system has become more stable and less susceptible to liquidity-driven crises post these reforms [38][37][39].

3. Methodology

The methodology for this report includes a systematic review of existing literature, reports available in the industry, and various regulatory guidelines, all aimed at achieving a comprehensive overview of the current landscape of digital banking and liquidity management in the U.S. Analysis of real-life case studies and examples that highlight the most significant challenges posed on banks with regards to liquidity management in the digital banking context. Secondly, the study provides an overview of the technological solutions and innovations that can help to improve the liquidity management process, and policy-regulatory implications to facilitate the banking sector adapting to the progressive technology age.

3.1. Policy and Regulatory Recommendations

Given the changing regulatory environment, there has been an increasing focus on liquidity management in the banking world, specifically in terms of digital banking. In particular, policymakers and regulators have introduced several measures to improve the liquidity resilience of banks, including the Basel III framework, the Liquidity Coverage Ratio and the Net Stable Funding Ratio. The purpose of these regulations is to require banks to hold a minimum amount of unencumbered high-quality liquid assets to protect the financial system against liquidity shocks and stress.

Despite the post-crisis reforms, others argue that the current rules are not necessarily well-suited to address the distinct liquidity management challenges that come with the digital banking age. In response to these concerns, policymakers and regulators must strengthen regulatory guidance and oversight of the liquidity management practices of banks, especially to address the particular risks and vulnerabilities arising from the rapid digitalization of the banking sector. Moreover, regulators such as the SEC should encourage the development and implementation of industry-wide standards and best practices with regard to liquidity risk management to ensure a consistent and coordinated approach by all banks.

Lastly, Regulators should enforce strong mechanisms promoting effective data sharing and interoperability amongst traditional banks and fintech companies to help in efficient liquidity management across the financial ecosystem.

3.2. Implications

The effects of liquidity management in the digital banking era extend well beyond the traditional realm of a given financial institution's risk exposure and can have systemic repercussions

Higher dependence on volatile funding sources and the rising influence of fintech companies on payment flows can amplify the risk of liquidity shocks and spillover effects in the banking sector. Therefore, if banks do not properly run their liquidity, it can become a systemic crisis, as the interconnectedness of the financial system means that the liquidity challenges at one bank can spread swiftly.

Furthermore, the absence of transparency and standardized reporting of digital banking liquidity metrics can complicate the process for regulators and policymakers to adequately monitor and react to emerging risks in a timely manner. In order to address the potential financial stability risks, there is a need for concerted efforts from banks, regulators, and policymakers to improve the liquidity resilience of the banking sector in the digital era.

4. Conclusion

Liquidity management in the U.S. has undergone a fundamental transformation as a result of the emergence of digital banking. Digital banking, despite its ability to boost the efficiency of transactions, customer convenience, and financial inclusion, has increased liquidity risk through its effects on the volatility of deposits, the real-time need for transactions, and the rising cost of compliance. Brick-and-mortar liquidity management models predicated on stable deposit bases and consistent fund flows are now being challenged by the velocity and unpredictability of digital transaction volumes, the rise of fintech competitors, and the need for immediate liquidity responses.

The study emphasized the need for traditional banks to adopt emerging technologies such as AI-driven liquidity forecasting, real-time treasury management systems, and blockchain based payment platforms. Despite the regulatory frameworks like Basel III that have been put in place to ensure liquidity resilience, regulators need to continuously adapt to advancements in technology to mitigate the nature of risks digital banking poses. The emergence of fintech competition and customer demands necessitates a more dynamic, data-informed approach to liquidity management.

Overall, an era of digital banking calls for a whole new perspective towards liquidity — from a traditional, static view of liquidity reserves to a real-time, technology-driven, regulatory-compliant liquidity management landscape. Banks will have to adapt early to adopt these advanced technologies.

Recommendations

As the banking industry continues to digitalize, a series of challenges specific to liquidity management has arisen in the U.S. Liquidity management has become a challenge due to the ever-evolving financial landscape. In order to remain competitive and successful, traditional banks need to respond to these changing customer behaviors and the emergence of fintech companies that disrupt the financial ecosystem as well as the rapidly evolving financial regulatory environment.

Future studies should also investigate the long-term impact of digital banking on liquidity risk and formulate new liquidity management strategies that would be responsive to the evolving landscape.

Also, regulatory authorities and policymakers will need to continuously evaluate and refine the regulatory framework, to ensure the regime is fit for purpose for the digital economy, through fostering financial stability and acting as an enabler for the U.S. banking sector to grow sustainably.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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