

Optimizing Liquidity Management in Islamic Banks: A Risk and Shariah Compliance Perspective

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Abstract

This study aims to determine the concept and role of optimizing liquidity management in Islamic banks. Liquidity management is a very important aspect of Islamic bank operations. Adequate liquidity is needed to meet short-term obligations and support business growth. The purpose of optimizing liquidity management, analyzing the concept and role of optimizing liquidity management in Islamic banks in Indonesia, given the importance of liquidity management in Islamic banks lies in its ability to meet financial obligations without violating sharia principles, so strategic steps are needed to anticipate liquidity risk. The method used in this study is conceptual analysis through literature review on liquidity strategy and funding structure in Islamic banks. The main findings indicate that effective liquidity management does not only focus on short-term aspects, but also includes long-term strategies related to funding structure, which is important for the sustainability and stability of the bank. The conclusion of this study is that liquidity management is a crucial foundation for the operations of Islamic banks. The effectiveness of this management not only ensures the fulfillment of short-term obligations in accordance with sharia

principles, but also maintains customer confidence, mitigates risk, optimizes funds, and complies with regulations.

Abstrak

Penelitian ini bertujuan mengetahui konsep dan peran optimalisasi manajemen likuiditas pada bank syariah. Pengelolaan likuiditas merupakan aspek yang sangat penting dalam operasional bank syariah. Likuiditas yang memadai dibutuhkan untuk memenuhi kewajiban jangka pendek dan mendukung pertumbuhan bisnis. Tujuan dari optimalisasi manajemen likuiditas, menganalisis konsep dan peran optimalisasi manajemen likuiditas pada bank syariah di Indonesia, mengingat pentingnya pengelolaan likuiditas dalam bank syariah terletak pada kemampuannya untuk memenuhi kewajiban keuangan tanpa melanggar prinsip syariah, sehingga langkah strategis diperlukan untuk mengantisipasi risiko likuiditas. Metode yang digunakan dalam studi ini analisis konseptual melalui tinjauan literatur mengenai strategi likuiditas dan struktur pendanaan pada bank syariah. Temuan utama mengindikasikan bahwa pengelolaan likuiditas yang efektif tidak hanya berfokus pada aspek jangka pendek, tetapi juga meliputi strategi jangka panjang yang berhubungan dengan struktur pendanaan, yang penting untuk keberlangsungan dan stabilitas bank. Kesimpulan dari studi ini pengelolaan likuiditas merupakan fondasi krusial bagi operasional bank syariah. Efektivitas pengelolaan ini tidak hanya menjamin pemenuhan kewajiban jangka pendek sesuai prinsip syariah, tetapi juga memelihara kepercayaan nasabah, memitigasi risiko, mengoptimalkan dana, dan mematuhi regulasi.

Keywords: Islamic Bank, Liquidity, Management Strategy, Management.

Introduction

In addition, Islamic banks also face challenges in managing liquidity due to the limitations of Islamic money market instruments. The availability of liquid instruments that comply with sharia principles, such as sukuk (sharia bonds) and sharia interbank money market instruments (PUAS) is still limited in some countries. This condition forces Islamic banks to develop innovative strategies in managing their liquidity, including looking for alternatives that comply with sharia principles.

In the context of Islamic banking, the understanding of liquidity goes beyond the mere availability of cash. Liquidity encompasses a bank's ability to meet its short-term financial obligations without disrupting smooth operations. This requires careful management of assets and liabilities, which must be in line with sharia principles, such as the prohibition of *riba* (interest) and excessive speculation (*gharar*). As a result, liquidity management strategies in Islamic banks require a different and more complex approach compared to conventional banks that operate based on conventional principles.

In the global context, Islamic banks also need to pay attention to international regulations and standards related to liquidity management, such as Basel III. The implementation of these standards within the sharia framework requires adjustments and innovations to be in line with sharia principles without compromising financial stability. Therefore, research on liquidity management strategies in Islamic banks is very relevant and important to support the healthy and sustainable development of the Islamic banking industry. (Handayani and Abubakar 2018)

Islamic financial institutions, which have now become an integral part of the global financial order, carry out a crucial task in driving the economy. In carrying out their functions, Islamic banks face a unique challenge, namely how to maintain a harmonious balance between achieving profitability and maintaining liquidity. This challenge is further complicated by the sharia principles that underpin their operations. Therefore, effective liquidity management is no longer just an option, but an absolute necessity to ensure the sustainability and stability of Islamic banks amidst the ever-changing and uncertain market dynamics. (ANANDA MUHAMAD TRI UTAMA 2022a)

The fundamental difference between Islamic and conventional banks lies in the contracts used in financial transactions. Agreements such as *mudharabah* (profit sharing), *musyarakah* (capital cooperation), and *ijarah* (lease) have special implications for liquidity management. For example, profit-sharing-based financing (*mudharabah* and *musyarakah*) requires more complicated calculations and risk management compared to interest-based loans at conventional banks. This is because the returns from this financing are uncertain, and depend on the results of the business being financed.

Theoretical review

Basic Concepts of Sharia Bank Liquidity Management

Liquidity management is the main foundation in the operations of sharia banks, the essence of which lies in the bank's ability to meet all of its short-term financial obligations in a timely manner. This fulfillment includes both obligations that can be predicted in daily business activities as well as obligations that may arise unexpectedly. In the context of Islamic banks, this ability is not only measured from a financial perspective, but must also be in line with Islamic principles that prohibit the practices of *riba* (usury), *gharar* (uncertainty), and *maisir* (gambling).

Adequate liquidity plays a vital role in supporting the smooth operation of Islamic banks. The availability of sufficient funds enables banks to process customer transactions on a daily, such as withdrawals, transfers, and financing. Without adequate liquidity, banks may experience operational obstacles, which in turn can damage their reputation and customer trust. Customers will feel insecure if banks cannot fulfill their withdrawal requests immediately. Therefore, maintaining a healthy level of liquidity is an absolute prerequisite for retaining customer trust and ensuring the continuity of the bank's business.

The basic concept of liquidity management in Islamic banks is not only limited to fulfilling short-term obligations, but also includes maintaining a balance between assets and liabilities in accordance with Islamic principles, supporting operational smoothness, maintaining customer trust, and the ability to respond to opportunities and address risks that may arise. Effective liquidity management is key to the long-term stability and sustainability of Islamic banks.

The Role of Risk Management in Islamic Bank Liquidity

Risk management plays a crucial role in the management of Islamic bank liquidity, forming a solid foundation for maintaining operational stability and stakeholder confidence. The integration of risk management and liquidity management is not merely a complementary measure, but a fundamental requirement in ensuring that Islamic banks can perform their functions sustainably and in accordance with Islamic principles. Without an effective risk management framework, Islamic banks will be vulnerable to various potential liquidity disruptions that could threaten their business continuity.

Liquidity risk monitoring is conducted on an ongoing basis to ensure that risk levels remain within acceptable limits. Information on daily liquidity positions, cash flow projections, and other risk indicators are closely monitored. A reliable management information system and timely reporting are essential in this monitoring process.

Any significant changes in risk indicators or market conditions that could potentially affect liquidity need to be immediately identified and further analyzed.

The final step in liquidity risk management is risk control. Various policies and procedures are implemented to mitigate the liquidity risk that has been identified and measured. The establishment of liquidity buffers in the form of highly liquid and high-quality assets, such as cash and marketable securities, is one common control strategy. Diversification of funding sources is also important to reduce dependence on one or a few specific sources of funds. In addition, the development of contingency funding plans is crucial to anticipate and overcome liquidity crisis situations. Thus, a strong integration between risk management and liquidity management will strengthen the resilience of Islamic banks in facing various challenges and ensure the sustainability of their operations in accordance with Islamic principles. (Pelita et al. 2025)

Sharia Compliance in Liquidity Management

In the context of liquidity management, Islamic banks must ensure that every financial instrument used for liquidity purposes meets Sharia criteria. For example, in placing short-term funds, Islamic banks will choose instruments such as Sharia Bank Indonesia Certificates (SBIS). SBIS are securities issued by Bank Indonesia based on Sharia principles such as *mudharabah* or *ijarah*. The profits obtained from SBIS must come from profit sharing or rental fees that are clear and agreed upon in advance, not from the practice of usury, which is prohibited.

The use of each liquidity instrument by Islamic banks must always refer to the fatwa issued by the National Sharia Council (DSN) of the Indonesian Ulema Council (MUI) and regulations established by supervisory authorities, such as the Financial Services Authority (OJK). DSN-MUI plays an important role in providing guidance and interpretation of sharia principles in the context of finance and banking. DSN fatwas serve as a reference for Islamic banks in developing products and services, including liquidity management instruments. Meanwhile, the OJK as the regulator has the responsibility to ensure that all Islamic bank operations, including liquidity management, are conducted in accordance with applicable laws and Sharia principles. Compliance with DSN fatwas and OJK regulations is imperative for Islamic banks to maintain the integrity and legitimacy of their operations in the eyes of the public and other stakeholders.

Optimization of Liquidity Management

One of the key strategies in optimizing liquidity management is effective cash flow management. Islamic banks need to have accurate and integrated systems to monitor and project incoming and outgoing cash flows on a daily, weekly, monthly, and even longer time periods. With a deep understanding of cash flow patterns, banks can anticipate future liquidity needs and take appropriate steps to ensure the availability of funds when needed. Efficient cash flow management also helps banks to identify potential excess funds that can be invested in sharia-compliant instruments that provide optimal returns, of course, by considering the bank's risk profile and market conditions.

In addition, diversification of sharia-compliant funding sources is also an important aspect in optimizing liquidity management. Over-reliance on one or a few specific funding sources can increase liquidity risk. Therefore, sharia banks need to develop various stable funding sources that are in line with sharia principles, such as funds from wadiah current accounts, mudharabah savings, mudharabah deposits with various terms, and sukuk issuance. Diversification of funding sources not only strengthens the bank's liquidity position but also provides flexibility in managing funding costs. Finally, the use of information technology also plays a crucial role in optimizing liquidity management. Advanced technology systems enable banks to monitor and project liquidity needs more accurately and in real-time. Technology also facilitates transactions in the Islamic money market and more efficient management of liquid asset portfolios.

Method

This research uses a qualitative research study method. In this writing, a set of relevant data is needed and also has an objective point of view so as to facilitate the data analysis process. In collecting data, the author uses literacy and documentation methods, namely by obtaining data and information in the form of narratives or images contained in books, articles, archives, websites, documents, journals, and other references that are considered relevant.

The research method contained in this journal is a qualitative method with a library research approach combined with direct observation. This approach was chosen to obtain a detailed and unambiguous understanding of the research topic from various perspectives. The literature study was conducted by tracing various references such as books, websites, articles or journals either online or offline in the library. The literature was analyzed in depth and critically to understand the theory, context, history, and recent developments

related to the topic of discussion which were then sorted out to be developed in this research (Alida and Anjastara 2021).

Results and Discussion

Basic Concepts and Urgency of Liquidity Management in Islamic Banks

Basic Concept of Liquidity Management in Islamic Banks

Liquidity management is one of the crucial aspects in banking management, including Islamic banks. In general, liquidity can be defined as the ability of a financial institution, especially a bank, to fulfill urgent short-term financial obligations, such as withdrawals by customers, payments to third parties, and maturing financing. In the context of Islamic banks, liquidity management has its own challenges because the bank's operations must comply with sharia principles. (jufendri J 2023)

Unlike conventional banks that can easily use interest-based instruments to manage their liquidity, Islamic banks are prohibited from conducting transactions that contain elements of *riba* (interest), *gharar* (uncertainty), and *maisir* (speculation/profit). Therefore, liquidity management in Islamic banks must be done through instruments and mechanisms that are in accordance with Islamic law.

The urgency or importance of liquidity management in Islamic banks cannot be ignored, because this has a direct effect on the sustainability and stability of the bank's operations. Some reasons for the importance of liquidity management include (Ichsan 2014):

1. Maintaining Customer Trust and Financial Stability
2. Fulfilling Operational Obligations on Time
3. Anticipating More Complex Liquidity Risks in Sharia System
4. Optimizing Fund Utilization and Increasing Efficiency
5. Fulfilling Regulatory Requirements and Supervisory Standards

Short-Term Liquidity Management Instruments of Islamic Banks

In its operations, Islamic banks have the responsibility to ensure that the funds managed can always be available to meet short-term needs such as withdrawal of funds by customers, payment of interbank obligations, and maturing financing. For this reason, financial instruments are needed that are not only economically effective, but also in accordance with sharia principles. Short-term liquidity instruments in Islamic banks must be free from usury (interest), *gharar* (uncertainty), *maysir* (gambling/speculation), and

other haram elements. Therefore, Islamic banks develop various alternative instruments based on sharia contracts such as mudharabah, musyarakah, wakalah bil ujah, murabahah, ijarah, SBIS, sukuk, deposito (Adiyes Putra P 2023).

Long-term Liquidity Management Strategy and Funding Structure of Islamic Banks

Long-Term Liquidity Strategy

Bank liquidity management can be defined as a process of controlling the liquid tools that are easy to fulfill in order to meet the needs and obligations of banks that must be paid immediately. Daily bank liquidity control in the form of maintaining all liquid tools that can certainly be controlled by the bank (balances at the central bank, cash) can be used to meet the emergence of bills from customers or the public that come at any time or at any time. (Adiyes Putra P 2023)

Bank liquidity management is also part of liability management. Through good liquidity management, banks can provide confidence to depositors that they can withdraw their funds at any time or at maturity. Therefore, banks must maintain a certain amount of liquid assets to ensure that they can meet their short-term obligations.

Liquidity management strategies in an economy that is already in the current stage of development are found in various methods of liquidity management in various non-bank financial institutions and bank financial institutions. This management can affect the financial development. It is so central in liquidity management to anticipate liquidity risk that liquidity management is needed. Through short-term assets that must be maintained such as cash, maintaining other earning assets sufficiently, easily saleable and others. (Fitriani, Accounting, and Bandung 2020) There are two factors that can affect liquidity, namely internal factors and external factors, this internal factor comes from within the bank itself which can affect the occurrence of large fluctuations in the liquidity level of a company. In internal factors that affect banks, namely HR empowerment, work motivation and also organizational structure. External factors, come from outside which more or less affect the success or failure of a bank in controlling its liquidity position. External factors such as asset liquidity management, liability liquidity management and balanced liabilities (Wati 2024).

Funding Structure of Islamic Banks

The main sources of capital for Islamic banks are core capital and quasi-equity. Core capital is capital that comes from the owners of the bank, which consists of capital paid up by shareholders, reserves and retained earnings. Quasi-equity is the funds recorded in the bank's profit or loss sharing accounts and protects the interests of deposit (wadiah) or loan (qard) account holders, especially on assets funded by own models and wadiah or qard funds.

The funds of profit-sharing accounts (mudharabah), can also be categorized as capital, this is what is usually referred to as quasi equity. But this account can only bear the risk of assets financed by funds from the profit-sharing account itself. In addition, the owner of the profit-sharing account can refuse to bear the risk of the assets it finances, if it is proven that the risk arises from mismanagement, negligence or fraud committed by the bank's management as mudharib.

Capital is part of the funds that banks can use in their daily activities. An important thing related to the problem of funds is how to carry out fund management activities. Fund management is how to collect and allocate public funds and capital funds to obtain Islamic bank objectives effectively and efficiently. (Atabik 2022)

The Role of Technology and Digitalization in Liquidity Management of Islamic Banks

The digital era is an era in which the emergence of internet networks, especially computer information technology. In this era, humans in general have a new lifestyle that cannot be separated from electronic devices. Technology has become a tool that can help most human needs. Technology has been able to be used by humans to make it easier to do any tasks and jobs. The important role of technology is what brings civilization humans are entering the digital age. Especially when looking at the millennial generation, who cannot be separated from digital technology, both for daily life and business activities. (Latifah 2020) Digital technology no longer uses human or manual labor. However, it tends to be an automatic operating system with a computerized system or a format that can be read by a computer. The digital era is also referred to as the era of information and communication. Because in this era, information has developed rapidly throughout the world. Many new technologies have been created to make it easier for people to do their tasks and businesses. Some information is migrated physically to electronic formats. Modern devices such as smartphones, mobile computers, and tablets are

creations of the digital age and are essential for this generation. (Susantun, Mifrahi, and Sudarsono 2019)

Digitalization changes the perspective of institutions or individuals in carrying out activities, especially financial transactions, it results in damaging and killing industries that do not want to follow the global flow. Meanwhile, an independent institution that has the functions, duties, and authority to regulate, supervise, examine, and investigate the six South Sumatra regions, according to Untung Nugroho “The condition of the nominal comparison of the income of private companies and competitors in one Islamic banking industry, this is due to the lack of Sharia financial inclusion, digitalization that has not yet covered and become a challenge to the development of Islamic banking”. Digitalization is the process of applying digital technology in various operational, strategic, and service aspects of an organization or sector. In the context of Islamic financial institutions, digitalization plays an important role in improving efficiency, transparency, and competitiveness. (Fitriani, Akuntansi, and Bandung 2020)

Challenges and Opportunities in Liquidity Management of Islamic Banks in the Digital Era

The digital era brings significant changes to the global financial landscape, including for Islamic banks. On the one hand, digitalization offers great opportunities to increase efficiency, expand reach, and improve service quality. However, on the other hand, Islamic banks also face various challenges that need to be overcome in order to remain relevant and competitive in this digital era. Despite facing various challenges, the digital era also opens up great opportunities for Islamic banks. Digital technology allows Islamic banks to reach a wider range of customers, including those in remote areas. Digital banking services can also improve operational efficiency and reduce transaction costs. (Ardianto et al. 2024)

Challenges in the Digital Age

The digital era offers great opportunities for the advancement of Islamic banking in Indonesia, but also presents challenges and potential threats if not properly optimized. Digitalization can improve efficiency and services, but Islamic banks must face challenges such as the need for data security, privacy protection, and customer trust in

digital systems. In addition, they must ensure that staff and customers have adequate skills in using digital technology. The inability to adapt quickly to technological changes can leave Islamic banks behind compared to other competitors. The challenges faced by Islamic banks in the digital era are: (Hidayah, Amanda, and Az – Jahra 2024)

1. Human Resource

The main challenge facing Islamic banks in the digital era is human resources (HR). HR is a crucial factor in the implementation of digital financial innovation. Recently, the issue of human resources has become a much-discussed topic in the world of Islamic banking. Along with the development of the financial services industry in the digital era, Islamic banks are required to have qualified and competent human resources in understanding and running the Islamic banking system. In addition, human resources must be ready to face technological developments that continue to advance. Islamic banks need to ensure that their workforce has adequate skills and knowledge to operate and develop digital services, in order to remain competitive and relevant in a changing market (Zia Ulhaq and Rasyad Al Fajar 2022).

2. Customer Protection

Digital financial innovation increases risks for banks and their customers. Protection of customers in digital services is an effort to prevent potential losses and unwanted things. In addition, this protection aims to realize an Islamic banking industry that has high credibility, so as to attract public trust to use Islamic bank services. Thus, Islamic banks can ensure the safety and comfort of customers in digital transactions, which in turn supports the growth and stability of the Islamic banking industry. Customer protection in digital banking services is regulated in several important regulations, including Law No. 8 of 1999 concerning Consumer Protection, POJK No. 12/POJK.03/2018, and Law No. 10 of 1998 concerning Banking. These regulations provide legal protection for customers in digital banking services. These protections include providing information on the potential risk of loss related to the use of digital banking services, maintaining the confidentiality of customers' personal data, and the bank's obligation to ensure the security of customer funds using digital

banking services. With this regulation, customers are expected to feel safer and more confident in using digital banking services provided by Islamic banks (Yustisia, M 2022).

3. *Cyber Security*

In facing the digital era, Islamic banking must be prepared to face challenges related to cybersecurity. In accordance with Article 2 Paragraph 2 POJK No. 12/POJK.03/2018, banks that provide digital services must implement risk management and the principle of prudence. Information security is a major issue in the implementation of Islamic banking technology. A case in point is the hacking of Bank Syariah Indonesia in May 2023, where hackers accessed 15 million customer data, including names, account numbers, transaction history, and balances. The incident disrupted the bank's services for several days and highlighted the importance of cybersecurity in digital banking. The hacking of Bank Syariah Indonesia provides valuable lessons for Islamic banking in Indonesia on the importance of building more resilient cybersecurity. To deal with threats such as hacking, skimming, and malware attacks, Islamic banks must innovate their digital security systems. This innovation is crucial to protect customer data and prevent harmful crimes. A robust and continuously updated security system will ensure effective protection for digital banking services. With the right security measures, Islamic banking can increase customer trust and maintain the integrity of their services in an increasingly complex digital era.

4. Lack of Public Financial Literacy

The current digital era shows a gap between financial inclusion and financial literacy among the public, which is a challenge for Islamic banking. The lack of public understanding of digital finance and Islamic banking often results in the view that Islamic banking is not much different from conventional banking. This challenge requires Islamic banking to utilize technological advancements to educate the public. Effective digital campaigns are needed to explain the differences between the Islamic and conventional banking systems, and to increase public understanding of the benefits and principles of Islamic banking. In this way, Islamic banking can address the financial literacy gap and attract more customers.

5. Emergence of Islamic fintech

Islamic technology-based financial institutions (fintech) have emerged as serious competitors to traditional Islamic banks. By offering similar financial services, such as financing, investment

and payment, Islamic fintechs attract customers who want convenience and speed in transactions. This competition forces Islamic banks to innovate continuously. They must improve the quality of digital services, develop innovative products, and offer a better customer experience. Without rapid adaptation, Islamic banks risk losing significant market share. In addition, Islamic banks also need to build strategic partnerships with Islamic fintechs. This collaboration can create a mutually beneficial synergy, where Islamic banks can utilize Islamic fintech's technology and innovation, while Islamic fintech can utilize the network and trust held by Islamic banks.

6. Changes in customer behavior

Customer behavior has undergone significant changes in the digital era. They prefer financial transactions that are fast, easy, and accessible anytime and anywhere through digital platforms. This requires Islamic banks to provide digital services that are safe, convenient, and in line with customer needs. Islamic banks need to invest in the development of digital platforms that are user-friendly, secure, and responsive. They also need to provide a variety of digital services, such as mobile banking, internet banking, and e-wallets, that can meet the diverse needs of customers. In addition, Islamic banks also need to educate customers on the safe and responsible use of digital services. This is important to build customer trust and prevent online fraud.

7. Islamic digital finance regulations

Regulations related to Islamic digital finance are still evolving and not yet fully established. Islamic banks need to comply with applicable regulations and adapt to regulatory changes. This requires investment in human resources and technology to ensure compliance with applicable regulations. Islamic banks also need to establish good communication with regulators to understand regulatory developments and provide constructive feedback. Clear and comprehensive regulations are essential to create a healthy and sustainable Islamic digital finance ecosystem (Rafidah and Maharani 2024).

Opportunities in The Digital Age

The financial services industry in Indonesia has gone through various phases of industrial revolution, including in the banking world, which is now entering the digital era. In this era, the utilization of technology is a must for the progress and development of Islamic

banking. The digital era opens up various opportunities for Islamic banks, especially in developing their service systems and products. By utilizing digital technology, Islamic banks can improve operational efficiency, expand market reach, and offer more innovative services. The opportunities faced are:

1. Society

The main opportunity for Islamic banks in utilizing technology in the current digital era is the society itself, especially related to the confidence of the Muslim community in Indonesia and the high use of the internet. With a population dominated by generation Z, millennials, and X-these three groups have high technological adaptability- Islamic banks have a great opportunity to develop services and products. The high internet usage opens up opportunities for Islamic banks to innovate in services and product offerings that suit customer needs. By utilizing digital technology, Islamic banks can meet the expectations of a more digital-savvy society, increase trust, and expand their market reach (Marzuki 2018).

2. Product Promotion

The second opportunity that Islamic banks have in the digital era is product promotion. The digital era allows Islamic banks to disseminate information and understanding about their products quickly and effectively. Through digital platforms, Islamic banks can utilize technology to conduct surveys and identify products needed by the community. With easy and efficient access, customers can quickly find out about the various products offered by Islamic banks. This opens up great opportunities to increase product visibility and attract the attention of potential customers. With the right digital promotion strategy, Islamic banks can utilize the digital era to expand their market reach and increase public understanding of their products.

3. Products needed by the public

So far, Islamic banking products are often considered difficult to access by the public. In the digital era, Islamic banks need to adapt and innovate to become financial institutions that provide convenience in financing. Currently, many financing services have been taken over by fintech companies, so Islamic banks must be able to present digital-based products. As an intermediary financial institution, Islamic banks must meet customer needs by providing digital products that facilitate access and use. This is an important opportunity for Islamic banks to fill the void in the financial

services industry, expand their market reach, and enhance their competitiveness by keeping up with technological developments and modern consumer preferences.(Rosida 2022)

4. Operational efficiency and cost reduction

Digital services can improve the operational efficiency of Islamic banks and reduce transaction costs. Automation of business processes and the use of digital technology can reduce banks' operational costs, such as paper costs, transportation costs, and labor costs. This enables Islamic banks to offer financial products and services at a lower cost to customers. In addition, higher operational efficiency can also increase the profitability of Islamic banks. For example, with digital services, customers can make money transfers, bill payments, and other transactions online, without having to visit a bank branch. This reduces the bank's operational costs and provides convenience for customers.

5. Data analysis and prediction of liquidity need

Big data and artificial intelligence (AI) can help Islamic banks analyze financial data and predict liquidity needs. Accurate data analysis can help Islamic banks manage liquidity more effectively and efficiently. With data analysis, Islamic banks can understand customer transaction patterns, predict cash flows, and identify potential liquidity risks. This allows Islamic banks to take appropriate actions to maintain their liquidity stability. For example, AI can be used to predict customer withdrawals based on their transaction patterns. This allows Islamic banks to prepare sufficient funds to meet liquidity needs.(Manik and Firdaus 2024)

6. Collaboration with Islamic fintech

Collaboration with Islamic fintech can expand the range of services and increase product innovation. Islamic banks can work with Islamic fintech to develop digital financial products and services that suit customer needs. This partnership can create a mutually beneficial synergy, where Islamic banks can utilize the technology and innovation of Islamic fintech, while Islamic fintech can utilize the network and trust owned by Islamic banks. For example, Islamic banks can work with Islamic fintech to offer Islamic microfinance services online. This can help Islamic banks to reach a wider range of customers and increase financial inclusion.

In the face of technological developments in the digital era, Islamic banks in Indonesia face various factors that can both support and hinder their growth. These factors include human resources, maximum utilization of technology through fintech, and regulations as

a legal umbrella for Islamic banking practices. To overcome these challenges and increase potential and presence in the digital era, various preparations are needed. First, improving workforce skills in understanding and using Internet of Things (IoT) technology in the banking industry. Second, the utilization of digital technology to boost productivity and competitiveness. Third, the application of digital technology by national industry players. Finally, technological innovation through startup development. By preparing for these things, Islamic banks can face the challenges of the digital era and remain relevant in an increasingly competitive market, as well as better meet customer needs.

Along with technological advancements, Islamic banks need to adjust their strategies by introducing digital-based banking services. This transformation is being done gradually, by transforming traditional Islamic banking services into a form of digital banking. Digital banking allows customers to perform various banking activities without having to visit a branch office. From opening accounts to conducting financial transactions, everything can be done easily through devices such as gadgets or smartphones. This change not only makes it easier for customers, but also increases the efficiency and accessibility of Islamic banking services. Islamic banks that adapt to digital technology will be able to meet the needs of modern customers who want fast and practical services. Thus, the transformation towards digital banking is an important step for Islamic banks in facing the digital era and remaining competitive in the banking industry (Yusuf et al., 2024).

The rapid development of information technology can change customer behavior and increase their needs. Islamic banks are faced with the challenge of continuing to meet these needs through various strategies. One of the main strategies is to improve services so that customers can access banking services independently (self service) without the need to visit a bank office. This self-service allows customers to perform various banking activities easily. Examples of services that can be accessed independently include account registration, transactions such as payments, cash withdrawals, and transfers, as well as various other banking services. By implementing self-service, Islamic banks can improve efficiency, convenience, and customer satisfaction. This adaptation allows Islamic banks to remain competitive and relevant amidst the ever-evolving technological advancements, ensuring that customers' needs are met in a fast and practical manner (Tartila 2022).

The digital era provides great opportunities but also brings challenges to the Islamic banking industry. Therefore, Islamic banks need to have effective and efficient strategies to overcome the problems that arise. The rapid growth of digital technology is a new challenge, but it can be overcome through the development of digital banking technology. As a growing financial services sector that plays an important role in Indonesia's economic growth, Islamic banks must adopt digital technology to maintain their existence. The adoption of digital technology allows Islamic banks to remain relevant and continue to meet the needs of the community. By utilizing technology, Islamic banks can improve operational efficiency and provide better services to customers. This transformation also helps Islamic banks remain competitive and adapt to changes in the banking industry that are increasingly driven by technology (Setiawan and Mugiyati 2023).

Implementation of Liquidity Management in Islamic Banks

Bank liquidity management is also part of liability management. Through good liquidity management, banks can provide confidence to depositors that they can withdraw their funds at any time or at maturity. Therefore, banks must maintain a number of liquid tools to ensure that the bank can meet its short-term obligations at any time. A sharia bank is said to be liquid if it can maintain reserve requirements at Bank Indonesia in accordance with applicable regulations, can maintain current accounts at Correspondent Banks. Current Accounts at Correspondent Banks are accounts maintained at Correspondent Banks whose amount is determined based on the Minimum Balance, and can maintain a sufficient amount of cash to meet cash withdrawals.

In managing funds, banks will experience one of the three things below, namely a balanced position (square) where the supply of funds is equal to the needs of available funds, a position more (long) where the supply of funds is more than the needs of available funds, and a position less (short) where the supply of funds is less than the needs of funds. In operational activities, banks can experience excess or lack of liquidity. If there is an excess, it is considered a bank profit. Meanwhile, if there is a lack of liquidity, then the bank needs a means to cover the shortage. (RARA 2013)

1. Liquidity Management Mechanism of Islamic Banks

Payment transactions in banking activities are carried out through a clearing mechanism by charging the bank's current account with Bank Indonesia (BI). If in the implementation of the bank balance becomes less than the Reserve Requirement (GWM),

the bank or its branch offices are subject to payment obligations. For provisions regarding the amount of currency and mechanism of GWM for Islamic commercial banks, there is now a separate regulation, namely PBI No. 6/21/PBI/2004 concerning minimum reserve requirements in rupiah and foreign currencies for commercial banks that carry out business activities for those who conduct business based on sharia principles.

For Islamic banks that experience a shortage of funds can issue Interbank Mudharabah Investment certificates (IMA) which is a means of investment for Islamic banks and conventional banks. Based on the provisions of article 3 of PBI No.2/8/PBI/2000, IMA certificate is the only tool used in operational interbank money market based on sharia principles. In PUAS activities, payment transactions are also carried out through a clearing mechanism by charging the relevant Islamic bank's current account at BI. Provisions regarding this clearing are regulated in PBI No. 2/4/PBI/2000 dated February 11, 2000 for Islamic commercial banks and Islamic business units of conventional commercial banks.

Clearing for Sharia Commercial Banks (BUS) and Sharia Business Units of Conventional Commercial Banks (UUS BUK) and WGM essentially regulates the supporting techniques of the PUAS mechanism, such as the number of accounts that must exist at BI for each BUS and UUS BUK and handling negative current account balances for conventional and sharia business activities. Meanwhile, to maintain the monetary stability of Islamic banks participating in PUAS, BI absorbs the excess liquidity of Islamic banks through the issuance of wadiah certificates (deposits). To overcome the mismatch (lack of inflow of funds from the outflow of funds) in the daily activities of Islamic banks can be overcome through short-term financing facilities for Islamic banks (FPJPS).

2. Liquidity Management on the Fund Raising Side

Most of the public funds received by banks are short-term in nature such as demand deposits, savings and deposits.

- a. Current account products, for example, with withdrawal media in the form of checks or bilyet giro, are intended for the use of customers to carry out transactions, either receiving money or paying money, to its partners. One of the measures used to see how much current account funds actually settle in the bank is the floating rate (FR). $FR = (\text{average amount of funds that are mutated or average funds}) \times 100\%$ If the FR ratio for current funds ranges from 70-80%, it means that only 20-30 percent of current funds are actually facing the bank.

- b. Savings products take relatively longer to settle in the bank because they do not use checks and bills of exchange. In the past, customers had to come to the bank office to withdraw or deposit money into their savings account. However, with the expansion of the ATM (Automated Teller Machine) network, it has become easier for customers to withdraw their savings. The wider access to ATMs equipped with Electronic Debit Card (EDC), which is an electronic payment tool for savings cards, has made the FR of savings products increase significantly. There are usually two ways that banks reduce the FR of savings, namely by:
 - a. Encouraging customers to make non-cash transactions, for example transferring funds from one account to another, so that the funds remain in the bank.
 - b. Providing ATMs that can accept deposits so that funds withdrawn are replaced by funds deposited.
 - c. Time deposits are relatively more predictable as they have clear tenors. Currently, deposit tenors in Indonesia consist of 1 month, 3 months, 6 months and 12 months. To reduce the urge of customers to withdraw their deposits before the agreed time, banks usually impose a “pre-maturity withdrawal penalty”. Statistically, the FR for deposit products is close to zero.
3. Fund Disbursement Side Management , most of the funds channeled by banks to the public are medium to long term in nature.
 - a. Consumer financing is usually offered using murabahah or ijarah contracts.
 - b. Working capital financing is usually offered under murabahah contracts for the procurement of goods, ijarah for the procurement of jaa, mudharabah to finance business.
 - c. Investment financing is usually offered using murabahah, IMBT, musyarakah mutanaqisah contracts.
4. Fund raising is the liability side, while fund distribution is the asset side of a bank. Liquidity gap is the difference between outstanding east and liabilities, or dynamically, the difference between changes in assets and liabilities. A positive gap occurs when assets are greater than liabilities, while a negative gap is the opposite. In general, liquidity management is done by:
 - a. If there is a lack of liquidity, Islamic banks seek funds, among others by:
 - 1) Selling liquid assets to get liquidity in the event that Islamic banks have liquid assets.

- 2) Receiving placement of funds or liquidity from other Islamic banks or other institutions/individuals in a sharia manner.
 - b. In the event of excess liquidity, Islamic banks place funds among others by:
 - 1) Buying liquid assets so that liquidity is productive.
 - 2) Placing funds with other Islamic banks or other institutions in a sharia manner.
5. Liquidity management problems of syraiah bank

The operational obstacle faced by Islamic banking is the difficulty in controlling its liquidity efficiently, it can be seen in several symptoms, among others:

 - a. Unavailability of immediate investment opportunities for the funds received. The funds accumulate and sit idle for several days, reducing their average income.
 - b. Difficulty in disbursing the ongoing investment funds, when there is a withdrawal of funds in a critical situation. As a result, Islamic banks hold a larger amount of liquid assets than the average conventional bank.

In general, Islamic banks experience two kinds of constraints when compared to conventional banks. (Nelly, Siregar, and Sugianto 2022) namely: lack of access to short-term funding, especially from BI as the central bank, and lack of access to the money market so that Islamic banks can only maintain liquidity in the form of cash. To anticipate these problems, there are several options that are mostly practiced by the managers of Islamic banks that are emergency in nature, namely: refuse to take interest, take money and use it for social purposes based on fatwa, invest in gold and or other precious metals in cash with futures contracts, and allow themselves to lose opportunities in the money market and deposit their funds in conventional banks without receiving interest in exchange for the services they get.

Analyzing the liquidity planning of a Shari'ah bank is to identify the main liquidity needs and then compare these needs with the amount of current assets owned by the bank at that time. (Winanti 2019) This analysis was carried out in several stages as follows:

- a. First stage

Classify the bank's main sources of funds based on their velocity. Group funds that are stable or fixed and funds that fluctuate. Estimate the percentage in each group of funds in terms of the time of withdrawal, then there are two types of funds, namely funds that can be withdrawn at any time including savings and current accounts wadiah and funds that are withdrawn at maturity including mudharabah investments. To estimate the number of withdrawals on savings and wadiah current accounts, Islamic banks must analyze the experience of daily withdrawals in the past (historical data).

b. Second stage

Group the types of assets that are liquid and illiquid. This grouping is intended to measure the bank's ability to meet its liquidity needs from its current assets.

c. Third stage

Compare total current assets with funds that are considered volatile. If the comparison is equal to one, it means that the position of liquidity needs is exactly equal to the amount of current assets owned by the bank at that time (Balance liquidity position).

d. Fourth stage

The liquidity needs of banks are usually influenced by the following factors. First, the reserve requirement set by the Central Bank, which is the reserve requirement set by Bank Indonesia. The reserve requirement is set by Bank Indonesia at a percentage of third party funds (DPK). Third party funds include all deposits in rupiah and foreign currencies at all relevant bank offices in Indonesia. Second, the need for operational funds. Third, financing distribution plans including bank commitments to customers or other parties to provide financing facilities or make investments. Business in banking is a business of trust; therefore the fulfillment of commitments must be the focus of Islamic banks. Fourth, the estimated withdrawal of funds by customers, both regular and irregular. Fifth, the minimum balance at the correspondent bank.

It must be realized that Islamic banking is an industry that is still in its early stages so that it has not been able to become a leader in the banking industry, especially in Indonesia. Based on this fact, in this liquidity issue, in addition to competing with fellow Islamic banks, competition also occurs with established conventional banks. (Trimulato 2018)

Conclusion

The basic concept of liquidity management in Islamic banks includes the bank's ability to meet short-term financial obligations in a sharia-compliant manner. Effective liquidity management is essential to maintain customer confidence, meet operational obligations, anticipate liquidity risk, optimize fund utilization, and meet regulatory requirements. In managing liquidity and funding structure, Islamic banks need to consider internal and external factors, and use appropriate liquidity management strategies. Digitalization can help Islamic banks improve efficiency and competitiveness, while complying with sharia principles. Thus, Islamic banks can ensure the stability and sustainability of their operations. Islamic banks' liquidity management in the digital era faces various challenges and opportunities. The main challenges include human resources, consumer protection, cybersecurity, the lack of public financial literacy, the emergence of Islamic fintech, changes in customer behavior, and the still-developing Islamic digital finance regulations. However, the digital era also opens up great opportunities for Islamic banks, such as improving operational efficiency, expanding market reach, and offering more innovative services.

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