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The Good and Bad News about the New Liquidity Rules of Basel III in Islamic Banking of Malaysia

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Abstract: How has Basel III (Bank for International Settlements), regarding the computation, measurement, and management of the liquidity coverage ratio (LCR), vitalized the Islamic banking sector in emerging economies? Vice versa, what is the Islamic banking sector's capacity to respond in embracing Basel III? This study aims to review the current issues faced by a bank as it discusses the current regulatory guidelines and operational challenges in implementing the system. Based on the implementation of LCR preliminary secondary data of Malaysian banks between 2010 and 2016, this study finds that the readiness of LCR system implementation in the Islamic banking industry is currently low because LCR is still relatively new for all financial institutions and vendors. There is a huge gap between the present system infrastructure of the banks and the LCR model requirements as defined by BNM (Bank Negara Malaysia) under Basel III. Nevertheless, this finding opens new horizons of understanding and practically offers further investigations for the whole banking sector in Malaysia. Thus, policy makers, regulators, and industry players should utilize a unique framework for Islamic banks when strategizing liquidity risk management.

Keywords: Basel III; liquidity coverage ratio; asset liability management; Islamic banking Malaysia; risk management; liquidity risk

1. Introduction

Basel III is an established regulation, and it was created in response to the financial crisis in recent years. Instability in the banking system has intensified since the 2007 global financial crisis. Ironically, the concern on liquidity risk management has only been in the highlight in the aftermath of the global financial crisis, with the introduction of Basel III liquidity requirements to remedy the banking sector. Since its inception, Islamic banking has gained systematic importance in the Malaysian banking industry, making the market less concentrated throughout years (Ab-Rahim and Chiang 2016). It has been documented that the growth of Islamic banking assets in Malaysia was approximately 23.8 percent in 2016, as compared to 23 percent in 2015 (IFSB 2017). At the end of 2017, Malaysia had a total of Islamic banking assets of US$204.4 billion and ranked third internationally after Iran and Saudi Arabia (The Malaysian Reserve 2018). If this trend continues, Islamic banks will gain increasing market power and serve as tough competition for conventional banks (Sahut et al. 2011). On the other side of the coin, the drastic growth of Islamic banking has raised doubts concerning whether Islamic banks will be capable of competing with conventional banking in the long run (Kabir and Worthington 2017). This issue has raised the concern of market players, academicians, and policymakers regarding bank performance, in the face of the current market structure of the banking industry in the country.

In 2008, the Basel Committee published a comprehensive guideline for the supervision of funding liquidity risk and risk management, which is named "Principles for Sound Liquidity Risk Management and Supervision" and is also known as the Basel III framework. This framework was introduced to enhance capital requirements as well as the importance of the liquidity coverage ratio (LCR), net stable funding ratio (NSFR), and leverage ratio (LR). Moreover, Basel III was created in the light of these developments (Blundell-Wignall and Atkinson 2010; Härle et al. 2010). A set of regulations provides resilience to the banking sector, in case of the financial crisis and economic adversity of this decade. Nevertheless, the implementation of Basel III has received significant attention in the banking industry. Recently, the LCR regulatory ratio has had a significant effect in the market, especially on the need to maintain "high-quality liquid assets" (HQLAa) and the need to obtain longer tenured retail deposits in order to keep the LCR at adequate levels. At this juncture, existing literature diverges into two strands (Cosimano and Hakura 2011). The first strand views that higher capital requirements lead to a lower risk for bankruptcies among banks (Admati et al. 2010). The contrasting view, however, argues that such higher capital requirements cascade to significant costs in implementation (BIS 2010).

The purpose of this study is twofold. First, this study analyzes the capacity for response and the readiness of the banking sector with regard to the new requirements of Basel III, which are based on the measurement and control of the liquidity coverage ratio (LCR). Second, this study analyzes the issues involved in the implementation of Basel III's LCR and the challenges associated with the banking sector complying with the Bank Negara Malaysia (BNM) requirement for submission of a full LCR report within seven days from the closing of the month's end, from June 2017 onwards. This study has significant findings and contributions from the lens of practice, while generating the descriptive impact of the new liquidity requirement from the context of a bank that practices Islamic banking in an emerging economy. Hence, it may broaden perspectives for practitioners and theorists in seeking solutions beyond Basel III.

The remainder of this paper is structured as follows. Section 2 covers the state-of-art in the literature. Next, the third section focuses on a brief discussion by describing the challenges in implementing and maintaining the LCR. Finally, the concluding remarks are listed in the fourth section.

2. Literature Review

2.1. Financial/Liquidity Crisis 2008

The recent financial crisis was a result of a liquidity crisis that emerged from a credit crisis. It is apparent that the crisis developed from a worldwide financial fiasco involving the collateralized debt obligations (CDOs), credit default swaps (CDSs), sub-prime mortgages, and frozen credit markets. The credit crisis involves two groups of people, which are homeowners (mortgages) and investors (large institutions, i.e., mutual funds, insurance companies, pension funds, and sovereign funds) brought together via the Wall Street financial system. In the early 2000s, the credit throughout the financial system was extended due to the low level of interest rates (Grosse 2012). To fulfill the "American dream" of owning a house for all borrowers regardless of their credit standing, the institutions, i.e., mortgage companies, commercial banks, and savings and loans (S&Ls) offered a vast range of mortgage-related financing. The loan repackaging institutions, for example, Fannie Mae and Freddie Mac, quasi-government agencies, acquired these mortgages from lenders and resold the mortgage-backed securities (MBSs) into the capital market upon obtaining high credit ratings from the credit agencies. In addition, the credit rating agencies failed to appreciate the risk of certain innovative financial assets such as mortgage-backed securities (MBSs), CDOs, and CDSs. During this time, the highest credit rating, AAA, was passed out like candy (Atik 2011). These securities started trading globally. Against this background, loan officers started making risky home loans. When they were running out of prime mortgages, they went on to low-credit, sub-prime mortgages, where there was a push by the government to extend more credits to lesser-earning Americans. The magnitude of this force resulted in growing of risky activities (Schwerter 2011). The sub-prime owners were barely

able to make their monthly installment at low interest rate levels, and when the interest rates shot up, they were unable to meet their monthly installments. This led to a massive sell out in properties, which drove the property prices down, and in turn, many loans ended up as non-performing loans. The property markets crashed and impacted the MBSs, where the lenders were unable to meet their obligations. On top of that, the insurers had insured the top investments bankers, i.e., the lenders who had issued these securities and that ended up bankrupting them as they could not meet the liquidity obligations related to the CDSs.

Apart from a credit crisis, the lack of funding strategies and assets management from the banks also surfaced during the financial crisis. The banks' vulnerability to liquidity-solvency feedbacks was intensified due to the extreme dependence on short-term wholesale markets to finance greater leverage, which had worsened the banks' maturity mismatch. This subsequently affected the banks' financing capability, resulting in an inability to trim their balance sheet, which had further exposed institutions to insolvency. As a result, capital and interbank markets were squeezed, whereby the financial losses of the banks started to mount (Giustiniani and Thornton 2011).

In the case of Malaysia, one could learn from the past 2009 financial crisis. Despite being exposed to the adversity of the global financial crisis, the domestic monetary and financial conditions to support economic activity remained positive. The financial intermediation process functioned commendably and smoothly due to the elasticity of the capital markets and banking sector, as well as the swift policy response. Domestic conditions were developed evidently towards year-end with positive signs of recovery. In early 2009, the Malaysian ringgit was volatile in the global financial markets; the Malaysian ringgit and regional currencies faced intense depreciation pressure due to a worldwide financial and economic crisis. However, with initial signs of stabilization in the global financial markets and economic activity, the sale of financial assets reduced globally by March 2009 (Bank Negara Malaysia 2009).

Malaysia's experience and performance during the financial crisis period can be viewed from the exchange rate, interest rates, and equity markets. Investor inclination had moved toward holding cash to preserve capital during this stressed financial situation. The reversal of portfolio investments and the outpouring demand for US dollars resulted in the remittance of funds to the US, which spawned substantial depreciation of currencies in the regional economies. On 2 March 2009, the Malaysian ringgit depreciated to its lowest of RM3.7255 against the US dollar since February 2006. The continuous net trade surplus had provided fundamental sustenance for the demand for the Malaysian ringgit, which had partly mitigated the depreciation effect. The interest rate was lowered substantially to support monetary policy to alleviate the impact of the domestic economic and financial crisis. In November 2008, there was a 25-basis-point reduction in the overnight policy rate (OPR), which subsequently reduced further in January 2009, by 75 basis points. However, an addition of 50 basis points was observed in February 2009, as presented in Figure 1. To accelerate the transmission of the policy rate to retail rates, the statutory reserve requirement (SRR) was reviewed from 4% to 1%. Bank Negara Malaysia managed to preserve a stable market environment even with the unpredictable global environment.

Within such a moment of the period, banks lowered their retail offer rates to businesses and households in response to the OPR reduction. On December 2009, the commercial bank's benchmark rate or base lending rate (BLR) was reduced from 6.72% to 5.51%, equivalent to 121 basis points. As a result, the interest cost on rate loans attached to the BLR was reduced. Thus, the disposable income of debtors was increased. In the same way, this had subsequently lowered the installment amounts for retail borrowers' loans. The change in the BLR was transferred swiftly, and banks reduced their respective BLRs within two weeks of the OPR changes. Another essential point is that the interest rate reduction benefited the new mortgagors, as households' and businesses' lending rates were reduced. In December 2009, the average lending rate (ALR) was reduced by 127 basis points as compared to October 2008, i.e., from 6.17% in October 2008 to 4.90% in December 2009. Upon revision of the OPR, entire sectors of the economy recorded lower interest rates. By the end of 2009, the ALR on loans outstanding was reduced to 4.83% through a re-pricing of new and existing loans. The financing

activity was sustained by the reduced interest rate atmosphere, which in turn adjusted the deposit rates downwards. While this is the case, BNM imposed a floor on fixed deposit (FD) rates ranging between 2.00% and 2.50% for the FDs with tenures between 1 and 12 months.

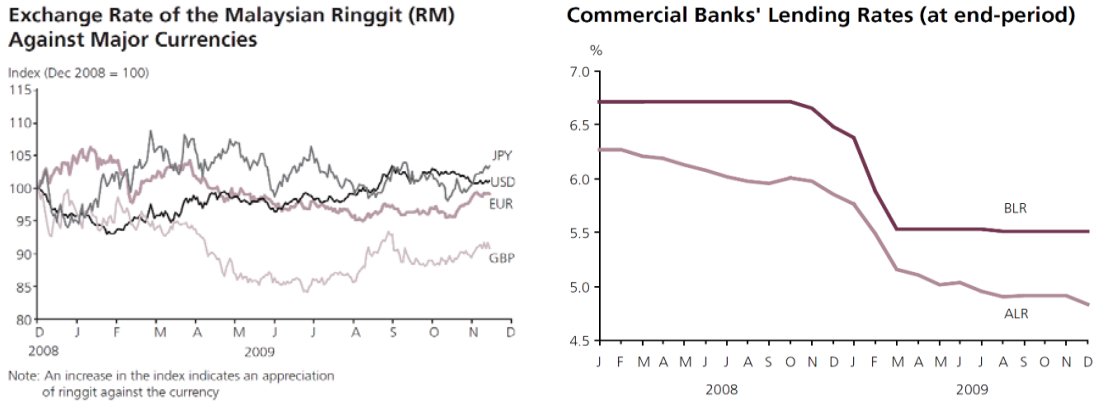


Figure 1. Comparison of exchange rate. Source: Bank Negara Malaysia (2009).

In early 2009, the local equity market had faced volatility due to the domestic and global market challenges. Later, in the second quarter of 2009, Malaysia and global equity markets showed positive recovery as investors became opportunistic in the highly stabilized financial markets and accommodative monetary environment. On 12 March 2009, the benchmark "FTSE Bursa Malaysia Kuala Lumpur Composite Index" (FBM KLCI) reached 838.4 points and later on climbed modestly, as presented in Figure 2.

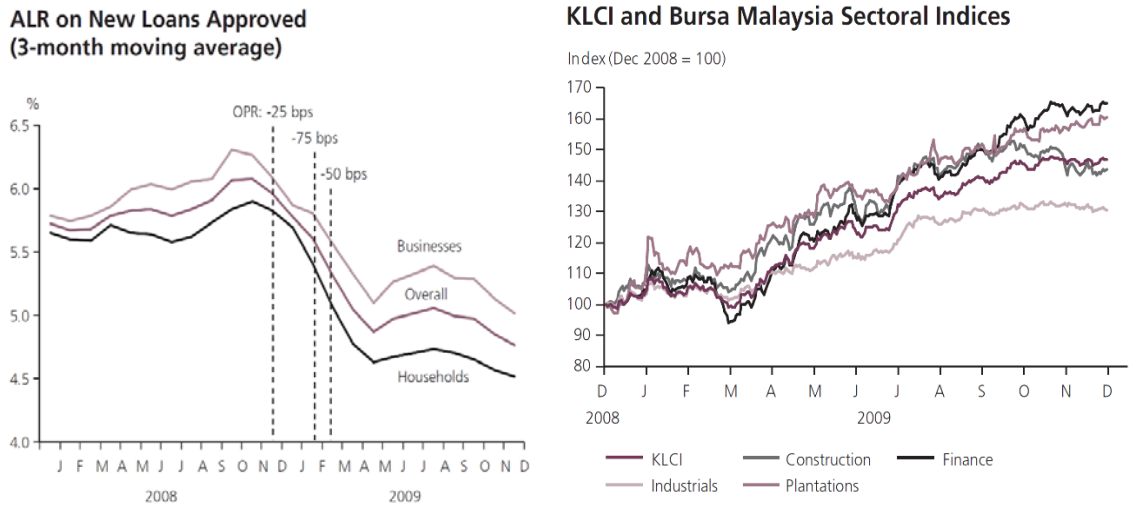


Figure 2. FTSE Bursa Malaysia Kuala Lumpur Composite Index. Source: Bank Negara Malaysia (2009). ALR—average lending rate; KLCI—Kuala Lumpur Composite Index; OPR—overnight policy rate.

The Islamic financial system requires all financial transactions to be associated with an asset-linked or trade contract. The Islamic financial system has been seen as a more resilient and viable alternative to financial shocks. In addition, riba or interest-based contracts are forbidden as Islam promotes trade activities and business to produce a fair and reasonable profit. Moreover, there is a close association between financial flow and output in Islamic finance. This vital ownership or real sale value of Islamic finance protects possible risks from leverage and speculative financial activities. Furthermore, Islamic finance is based on risk and profit-sharing bit (for example, Mudarabah contracts). In an Islamic finance structure, businesses are required to maintain a high level of disclosure and clearness in profit and risk sharing. These disclosures allow the market to allocate suitable risk premiums to companies,

thus improving the likelihood of market discipline. The Islamic finance structure is guided by Shariah (Islamic law), which provides financial stability through an integral check and balance system (Ahmed 2010). Another key benefit of the Islamic financial institution is to protect society and individuals from financial and economic crises. There is no doubt that riba (usury and interest) and maysir (speculative activities, e.g., gambling) led to the present financial crisis. The world financial crisis could be avoided by adhering to Islamic ethics and principles through the ban of riba and maysir practices and distinguishing others' interest in one's economic prosperities (Ahmed 2010). The Islamic financial system deals with real assets, which prohibits speculative activities and prevents asset bubble creation. On the contrary, the empirical results suggest that the conventional system in Malaysia was able to absorb the shocks better than that of the Islamic banks (Kassim and Majid 2010).

Previously, asset markets were flexible, and funding opportunities were available at low cost. Market fluctuations rapidly disperse liquidity and could also create illiquidity that can last for a lengthy period. The banking system faced difficulties and required central bank support (Basel III 2013). The Bank for International Settlements (BIS) has resolved that a lack of liquidity was an important substance for the crisis. Therefore, in responding to the speed at which much of the world's financial sector ran out of surplus, and especially overnight cash, in October 2008, Basel III set much higher standards for liquidity (World News Media 2013).

In addition, numerous problems have been identified among empirically oriented studies, including the contradictory features of the LCR and the NSFR among two central standards (Dermine 2013); the complexity of the liquidity regulations (Chorafas 2011; Haldane and Madouros 2012; Hoenig 2012); and the fact that even though the LCR constraint tends to increase the intertemporal persistence of the banks' deposits (i.e., the relationship between deposits in the previous and current period), it also increases the responsiveness of deposits to interest rate variations/shocks (Balasubramanyan and VanHoose 2013).

2.2. The Liquidity Coverage Ratio (LCR)

The LCR is a computable obligation by banks that seeks to ensure that the institutions hold adequate high-quality liquid assets (HQLAs) to endure a severe liquidity stress situation over 30 days at both the entity and the consolidated level. The computation of the LCR is defined as per the following:

$$LCR = Stock\ of\ HQLAs/Total\ Net\ Cash\ Outflow\ over\ the\ next\ 30\ calendar\ days.$$

The LCR was introduced by Bank Negara Malaysia (BNM) as a regulatory ratio on 1 July 2015, where the minimum requirement was fixed at 60% and increased in equivalent amounts yearly to reach 100% on 1 January 2019. This progressed method and the reviews of the 2010 publication of the liquidity standards was intended to ensure that the announcement of the LCR is without material disturbance to the orderly reinforcement of banking systems or the continuing financing of economic activity (Basel III 2013). In order to maintain the LCR, the banks should either have sufficient HQLAs or reduce the expected net cash outflows (NCOs) during a crisis. The LCR aims to promote short-term resilience of the liquidity risk profile of banks by ensuring that the banks have ready stocks of HQLAs, which are easily convertible into cash in the private markets to meet their liquidity needs under a 30 calendar day liquidity stress position. Thus, it would improve the banking sector's capacity to absorb shocks from various sources that arise from financial and economic stress, thus lowering the risk of spillover from the financial sector to the existing economy (Basel III 2013).

2.3. Origins of the Basel Committee and Revisions Made to the LCR by Basel Since Its Introduction in 2010

The origins of the "Basel Committee on Banking Supervision" (BCBS) came about in 1973 from the breakdown of the Bretton Woods system of managed exchange rates, which then led to the financial market turmoil. The central bank governors of the G10 countries established a Committee on Banking Regulations and Supervisory Practices at the end of 1974 in reaction to disruptions in the international

financial markets, which was later renamed the "Basel Committee on Banking Supervision". Formed as a forum for regular collaboration between its member countries on banking supervisory matters, the committee aims to improve financial stability by enhancing the supervisory knowhow and the quality of banking supervision globally (Tonveronachi 2007).

The banks are forced to hold more of their capital because shareholders' equity is always the last to be reimbursed in a scenario of bank liquidation. Thus, the idea of holding higher capital is that it will be available to absorb unanticipated losses without causing the bankruptcy of the bank. The Basel structure bases the computation of capital requirement on risk-weighted assets in order to discourage banks from taking excessive risks, in which it includes the riskiness of specific classes of borrowers. The Basel I (1994) was focused on shielding banks against credit risk, whereby the minimum "capital adequacy ratio" (CAR) was set at 8%. An explicit capital cushion for market risks was introduced in the 1996 Market Risk Amendment due to banks' activities of trading. A proposal for a new capital adequacy framework in June 1999 was introduced by the committee to substitute the 1988 accord. This led to the issuance of the Revised Capital Framework in June 2004, branded as Basel II. The new framework was intended to enhance the method of regulatory capital requirements, addressing the underlying risks and the financial innovation that had occurred in recent years (Committee on Banking Supervision 2015a). The completely revised Basel II framework offered a more sophisticated and thorough structure than Basel I in numerous aspects and came into force at the end of 2006. The changes were intended to reward and encourage continued enhancements in risk measurement and control.

Three pillars were introduced under Basel II. Pillar 1 comprises the minimum capital standards for operational risk apart from credit risk, and market risk was subsequently added. Pillar 2 places the supervisory review process under the purview of national regulators. Internal controls and supervisory review form the second axis of the regulatory framework. Banks are required to have an internal system and models to assess their capital requirements given the regulatory framework and incorporating each bank's specific risk profile. The integration of the nature of risks not fully covered by the accord, such as reputation risk, strategic risk, concentration credit risk, and interest rate risk in the banking book is required of all banks (IRBBB) (Balthazar 2006), and Pillar 3 entails the incorporation of disclosure standards directed at "market discipline" via the regulatory disclosure requirements. The market participants can access vital information relating to a bank's regulatory capital and risk exposures, which increases transparency and assurance about a bank's exposure to risk and the overall capability of its regulatory capital (Committee on Banking Supervision 2015a). This information is required to be publicly disclosed to the market at least twice a year via the bank's financial reports. The forms of risk and the choice of asset classes included for calculating capital requirements, as well as the techniques used for risk weighting—the standardized approach (SA) and internal ratings-based (IRB) approaches involve greater complexity under Pillar 1.

The amendments to the LCR include revisions to the characterization of HQLAs and net cash outflows. Among the changes made were expanding the description of HQLAs by including level 2B assets, which have been given higher haircuts and limits. The corporate debt securities that are rated A+ to BBB are given a discount of 50%. In addition, some unencumbered equities are exposed to a 50% cut, and certain residential mortgage-backed securities rated AA or higher are subjected to a 25% cut. The combined level 2B, after discounts, is subject to a boundary of 15% of total HQLAs (Committee on Banking Supervision 2013). Furthermore, banks must obey the local regulator's requirements for the following rating requirements for the qualifying level 2 assets, usability of the liquidity pool, operational requirements, operations of the cap on level 2 HQLAs, alternative liquid asset (ALA) framework, and central bank reserves details.

The variations to the explanation of the LCR, established and agreed by the Basel Committee over the past two years, also comprises some modifications to the assumed inflow and outflow rates, to better imitate actual scenarios in times of stress. The outflows on certain sorts of fully insured retail deposits have been reduced from 5% to 3%, and outflows on fully insured non-operational deposits from non-financial corporates, sovereign, public sector entities (PSEs), and central banks was lowered

from 40% to 20%. In addition, the outflow rate was reduced from 75% to 40% for "non-operational" deposits sourced from non-financial corporates, sovereigns, central banks, and PSEs. Other items listed were committed but unfunded: inter-financial liquidity and credit facilities, the committed liquidity facilities to non-financial corporates, trade finance, derivatives, equivalent central banks operations, and client servicing brokerage. The Basel Committee on Banking Supervision (BCBS) agreed to a revised schedule for phase-in of the standard and supplementary text to give effect to the committee's aim for the stock of liquid assets to be used in times of stress. The internationally agreed phase-in of the LCR was 60% in 2015, followed by a subsequent increase by 10% annually to reach 100% in 2019 (PwC 2013).

2.4. Why Is Basel III Different to Basel II?

In 2004, Basel I was replaced by a more risk-sensitive accord having three "mutually reinforcing pillars," Basel II (Kaur and Kapoor 2015). In mid-2003, the last Consultative Paper (CP3) was delivered, and the final proposal was circulated in June 2004 (Balthazar 2006). Recommendations with more refined descriptions for capital adequacy, disclosure requirements, and risk management (market risk and operational risk) were put in place. The risk weights for the corporate, bank, and sovereign claims were specified in this consultative paper via the use of external rating agencies (Mohammed Ahmed 2016). Market users can assess the capital adequacy of the banks via the disclosure requirements based on information on the scope of use, risk coverages, capital, and risk assessment procedures. The goal was to improve the comparability and consistency of disclosures through the revised Pillar 3 disclosures, as presented in Figure 3 (Committee on Banking Supervision 2015b).

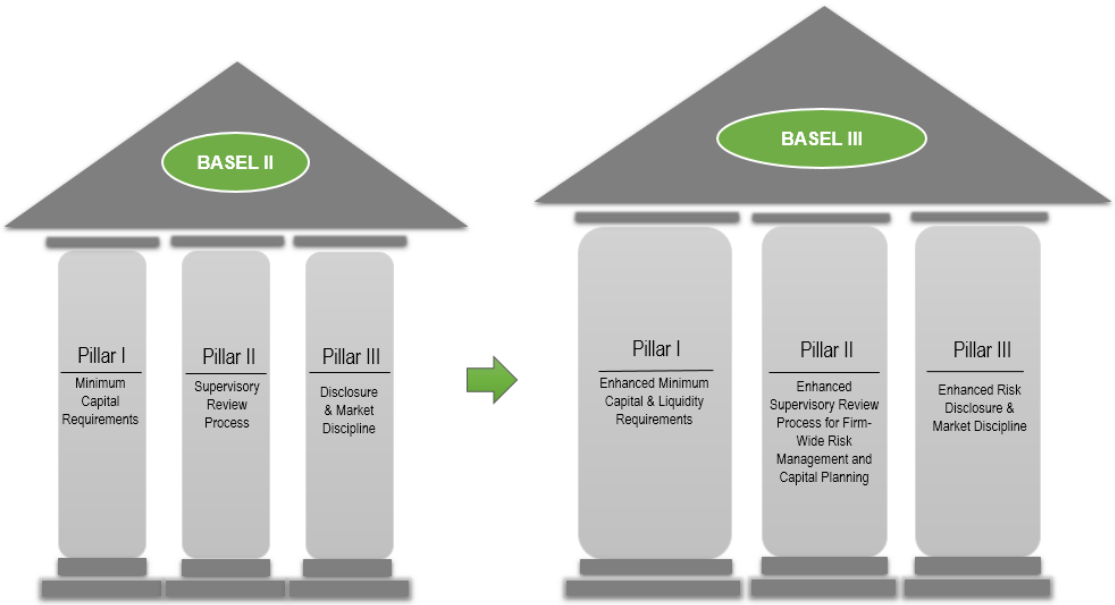


Figure 3. Enhanced requirements from Basel II to Basel III. Source: according to Moody's Analytics, September 2011.

The international financial crisis was a consequence of the failures of Basel II, where observers frequently mentioned that the dependency it caused on the rating agencies and regulatory capital requirements were determined based on the use of internal models (Moosa 2010). Since the Basel II accord appeared to be one of the causes of the global crisis in 2008, on 12 September 2010, the oversight body of the BCBS, consisting of Heads of Supervision and the Group of Central Bank Governors gave a press release stating a significant strengthening of the capital requirements (Allen et al. 2012). On 26 July 2010, the full endorsement of the agreement to the suggested reorganizations to the Basel II framework was achieved. These foundations aimed to formulate part of a package of transformations

known as Basel III (Morrison and Foerster 2010). The guiding principle aimed to encourage a more robust banking system by aiming towards the four vital banking considerations via capital, leverage, funding, and liquidity.

The common equity and tier 1 capital minimum requirements are 4.5% and 6%, while the minimum overall capital requirement are fixed at 8%. In addition, a 2.5% capital conservation buffer has been introduced. It is a requirement that the capital conservation buffer be met with common equity. As an institution starts to "use up" the conservation buffer, leading to the levels of common equity reaching the minimum required levels, it becomes subject to increasingly more stringent restraints on dividends and on discretionary executive compensation, leading to these payments being completely forbidden. Further to raising the capital requirements, the Basel III framework imposes stricter standards in order for instruments to be classified as common equity and be included as tier 1 capital (Hendricks et al. 2016). From January 2013, financial tools that do not meet the requirements as common equity are excluded, while instruments that no longer qualify as other tier 1 capital, or tier 2 capital, are gradually excluded over ten years (Morrison and Foerster 2010). Moreover, at the preference of the central banks of the countries, banks may be mandated to preserve a "countercyclical buffer" ranging from 0% to 2.5%, reliant on the economic environments.

The LCR necessitates banks to hold a cushion of HQLAs adequate to deal with the cash outflows faced in a severe short-term stress scenario, as indicated by supervisors. From 1 January 2019, the banks have been required to reach the minimum LCR requirement of 100%. The objective of the LCR is to ensure that banks will be able to withstand severe liquidity crises and prevent situations like a "bank run". The leverage ratio commenced in January 2015 and was under an observation period by Bank Negara Malaysia (BNM), and the maintenance of a minimum level of 3% started from January 2018. The bank's tier 1 capital divided by the average total combined assets of the bank is the computation for the leverage ratio. The NSFR was also introduced as a minimum requirement by 1 January 2018. For Malaysia, the leverage ratio and NSFR are currently being reported every quarter to BNM and are under an observation period (KPMG International 2011).

3. Discussion of the Challenges of the LCR

3.1. Challenges of Implementing the LCR

The requirement by the central banks across the world to adopt the Basel III standards is an operational challenge for the banking sector. In practice, the data infrastructure and calculation methods, as well as the incorporation of liquidity risk considerations into day-to-day decision-making remains a challenge. In addition to putting in place the right technology infrastructure, the banks need to educate their stakeholders, and appropriate governance must ensure that incentives are both balanced and compatible with creating an organization-wide liquidity risk culture (SunGard 2015).

For banks to meet the LCR reporting requirements by the regulators, they must set up a self-enforcing liquidity risk culture within the organization. Firstly, the data required for LCR computation requires detailed interpretation and analysis. The large volume of financial positions across the on and off-balance sheet has a different set of liquidity behavior and categories, which will change over time and must be classified accordingly. In addition, arriving at that liquidity perspective requires a detailed assessment of contractual, behavioral, and counterparty aspects of each position. It is important for banks to get this right from the start, and even more so for banks that are implementing a system. A fully configurable and automated process can be achieved for a well-defined and well-organized balance sheet position data. In order to achieve this, the classification of positions with specific attributes defined on the position level must be identified and maintained consistently.

The LCR ratios are governed by various classification criteria for slotting assets and liabilities in terms of their liquidation timing, behavioral balance volatility, lock-in terms, embedded protection and guarantees, encumbrance, and so forth. For such classifications, the data elements needed are, to some extent, subjective and might not be available in the traditional data columns of a bank's data

store (SunGard 2015). For example, in order to classify deposits either as "stable" or "less stable," it is necessary to first classify them as "insured" and "uninsured." The deposit insurance coverage is typically capped with a huge amount of dollars per depositor. In Malaysia, it is capped at RM 250,000per depositor (PIDM 2016). This must be managed on customer-level information, where one customer can have many deposit accounts with the bank. Typically, in the case of joint depositors, the deposit balance needs to be equally allocated to each joint account holder. Once this has been identified, depending on the categories of deposits, it needs to be further analyzed and divided into transactional, established relationship accounts, and a residual category. This information may or may not exist in the source system of data stores of the banks, and even if it does, it requires analysis and logic to be built into the system in order to combine various data from different reporting systems or manual inputs.

The assumption interpretation on HQLAs for the marketable and easily liquefiable securities of levels 1, 2Am and 2B have a varying degree of asset value haircuts, and this has been localized by each local regulator where BCBS has provided an example framework for liquidity assessment and term assessment of financial positions. These definitions and haircuts vary widely as market conditions change and are primarily defined as minimum regulatory levels. However, using these minimum levels may provide a false sense of security for some jurisdictions or under imminent market stresses. Therefore, adopting the Basel III liquidity ratio requires preparation for central banks to bridge the gap in classification conventions and localize the parameters (SunGard 2015). From a system point of view, if the HQLAs are classified as a trading book, the positions need to be marked to market daily, requiring the market prices to be extracted directly from a market provider and linked to the internal system (Sairally et al. 2015). This gives rise to additional costs for the subscription of the feed on the information in order to compute the correct market value for reporting.

Banks that have operations across various countries will have to report for individual entities as well as consolidate reporting across entities or within a group. Basel III has laid down restrictive conditions for the transferability of liquidity across jurisdictions. This transferability is not permanent, and jurisdiction-specific capital transfer laws may supersede the qualification of such under stressed market conditions (SunGard 2015). In addition, each subsidiary is required to submit to the group a set of reports on the LCR, where if the subsidiary is in a different country, the reporting differs slightly based on that country's regulatory requirements for LCR reporting (Song 2014).

The latest guideline issued by Bank Negara Malaysia (BNM) for the LCR computation includes the term qualifying term deposits (QTD), which enables a banking institution to exclude the deposits from its expected cash outflows. In order to qualify, deposits have to either satisfy the following conditions where an investor has no legal right to take out the deposits during a 30-calendar-day horizon or drawing deposits before prescribed maturity results in a penalty amounting to at least a full amount of the accrued interest of profit. However, the latter has been given leeway, where the banks are allowed to recognize as QTD all term deposits with a remaining maturity of more than 30 days, whereby a withdrawal preceding the prescribed maturity results in a cost of at least 50% of accrued interest or profit to the depositor for a period up to 31 December 2018 only (BNM 2015). This has caused banks to start implementing a penalty clause to discourage the premature withdrawal of deposits. This too needs to be flagged by the system, for those deposits that have a penalty clause that satisfies the QTD terms. Specific clauses may vary from one bank to another and may need to be computed by the system based on a certain logic for that specific bank.

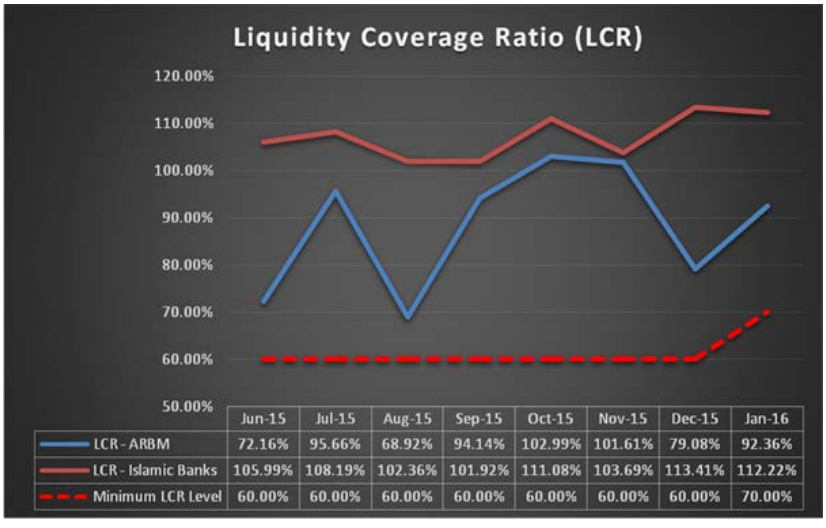
Another challenge in the implementation of the LCR is the reporting requirement by BNM, where a banking institution is required to submit the LCR reporting templates within seven days from the reporting position date commencing on 1 June 2017. This poses a major challenge to the entire banking industry, as most of them are currently preparing manual reports and need to immediately embark on a system implementation in order to meet the regulatory timeline. In order to implement the LCR in a system, the banks need to implement an ALM system if they do not already have one.

The cost and budget of implementing a system is always a challenge, and even more so in a small organization. There needs to be a business justification for implementing a system; however, in this case, a regulatory requirement is the justification'. However, the banks need to set aside a vast amount of budget, as well as resources, to implement a system for the LCR within a short period in order to comfortably meet the regulatory deadline set by BNM. In order to be sure that the hardware and software can meet the challenges represented by risk management, the IT requirement needed for such systems must be evaluated in depth and resorting, if necessary, to different exploration and data management techniques (Flores et al. 2006).

3.2. Challenges of Maintaining the LCR in Islamic Banks

It is clear that due to continuous regulatory monitoring of the quality of assets and term structure of funding, liquidity is currently a primary consideration when managing a balance sheet risk. The business units responsible for creating and maintaining liquidity need to be appropriately incentivized. At the same time, business units that consume this liquidity to support long-term high-yielding assets should pay to use the cushion of liquid asset stocks and long-term funding commitments. Here, liquidity needs to be transfer priced for the originating units, which in turn need to be paid by units enjoying the safety net of continuous funding for the desired term and through unexpected market turmoil. In the absence of appropriate incentive structures, enforcing the LCR in day-to-day business dealings is practically impossible—and arriving at the right price for liquidity is a challenge (SunGard 2015).

For the Islamic banking institutions (IBIs), it has been a challenge to obtain and maintain certain categories of deposits, which would help the LCR, i.e., the deposits under retail, which carry only a 10% or below runoff rate. In addition, IBIs are mostly dependent on corporate depositors and financial institutions, which demand a high rate of return on their deposits. This pushes the cost of deposits for the bank. Moreover, the LCR requires the deposits to be of tenors more than one month, and the higher the deposit maturity, the higher the cost of deposits is to a bank, as shown in Figures 4 and 5. The sophisticated depositors will always demand a higher rate as they are very much aware of the market conditions and current regulatory requirements on banks.

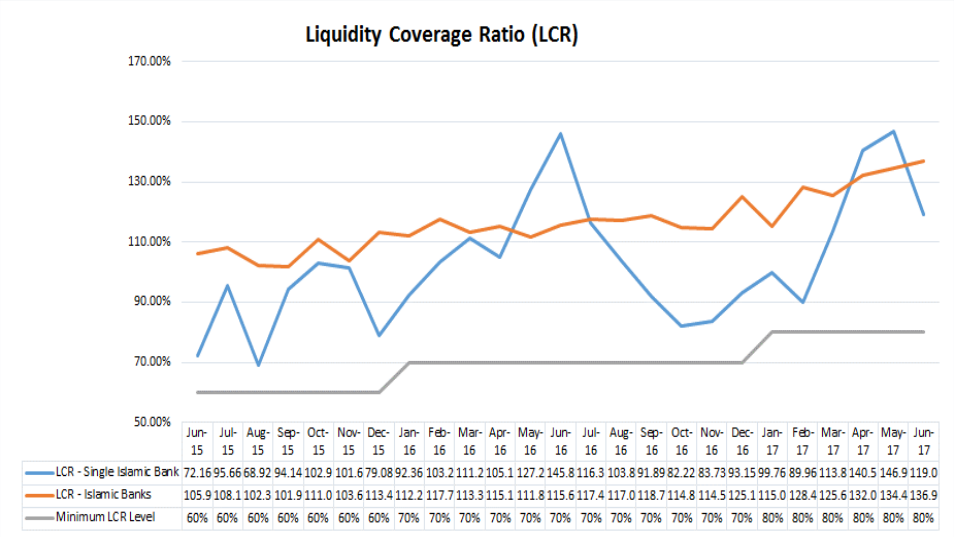


	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16
LCR - ARBM	72.16%	95.66%	68.92%	94.14%	102.99%	101.61%	79.08%	92.36%
LCR - Islamic Banks	105.99%	108.19%	102.36%	101.92%	111.08%	103.69%	113.41%	112.22%
Minimum LCR Level	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	70.00%

Figure 4. Graphical Presentation of liquidity coverage ratio (LCR).

In addition to the above, for an IBI offering an investment account deposit, the banking institution is required to compute and report the LCR for unrestricted accounts (UAs) for each different UA fund. Furthermore, the computation of the LCR for each UA fund includes only the HQLAs held explicitly for that UA fund, alongside the projected cash outflows and estimated cash inflows arising from that specific UA fund. The IBI is required to remove the HQLAs held explicitly for a particular UA fund, as well as the projected cash outflows and estimated cash inflows of the UA fund, from the computation

of the LCR at the banking institution level (and where appropriate at the Islamic window level) and for other investment account funds (BNM 2015). Therefore, an IBI's offering of investment account deposits needs to find a balance between their holdings of HQLAs against the deposits tagged to the UA in order not to end up having excessive imbalances in their reported LCR.



	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17
LCR - Single Islamic Bank	72.16	95.66	68.92	94.14	102.9	101.6	79.08	92.36	103.2	111.2	105.1	127.2	145.8	116.3	103.8	91.89	82.22	83.73	93.15	99.76	89.96	113.8	140.5	146.9	119.0
LCR - Islamic Banks	105.9	108.1	102.3	101.9	111.0	103.6	113.4	112.2	117.7	113.3	115.1	111.8	115.6	117.4	117.0	118.7	114.8	114.5	125.1	115.0	128.4	125.6	132.0	134.4	136.9
Minimum LCR Level	60%	60%	60%	60%	60%	60%	60%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	80%	80%	80%	80%	80%	80%

Figure 5. Graphical presentation of liquidity coverage ratio (LCR) between June 2015 and June 2017. Source: From author observation and Locally Incorporated Foreign Islamic Bank.

The unavailability of high-quality liquid assets (HQLAs) mainly for IBIs is another challenge for the Islamic banking industry, and mainly for individual banks with very stringent Shariah criteria. The industry needs to develop innovative Islamic sukuk structures that are widely accepted by all IBIs. Moreover, the need to maintain the LCR in foreign currency is also a challenge as some of the IBIs are unable to purchase the foreign currency sukuks due to non-acceptance of their Shariah requirements.

As illustrated above, the average LCR of Islamic banks in Malaysia is considerably below their conventional counterparts due to the challenges specific to Islamic banks detailed above, as shown in Figure 6.

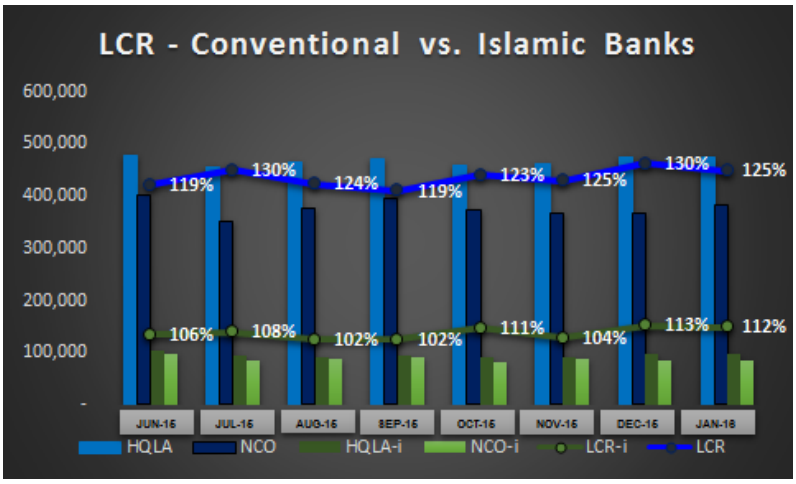


Figure 6. Liquidity coverage ratio (LCR) of conventional and Islamic banks. Source: Bank Negara Malaysia (BNM) Monthly Statistical Bulletin. HQL—high-quality liquid asset. NCO—net cumulative outflow.

3.3. Proposed Solutions

In order for the banking industry to meet the challenges discussed above, firstly, banks need to invest in training. It is important to educate their staff as well as senior management on the changes in the market environment. This is required in terms of the liquidity needs in the banking sector. Knowledge management within the bank is very crucial for ongoing sustainability and maintenance of the LCR. Banks need to ensure that the management and relevant staff are appreciative, understand the current liquidity position adequately, and possess an understanding of where the stress points are. This will enable a smooth system implementation and ongoing maintenance of the system to be met.

In addition, it is also crucial that a bank build a robust data framework in order to access extensive data on the counterparty, intent of holdings for each position in the balance sheet (or off-balance sheet), the cash flows and valuation characteristics of its financial positions, and available financial covenants. The banks can preserve the data framework by using a data warehouse or data mart. The implementation of an ALM system would facilitate all of the above, and besides, the implementation of LCR in a system would further facilitate the identification of account stamping type, insured or uninsured, transactional accounts, operational accounts, and deposits with established relationships. Additional data recognition and validation is required in the system for the implementation of the LCR and must be clearly defined with well-documented logic. Due to the current new requirements, these logics may not be available in the system and may have to be addressed outside the system and fed into the system through a separate ETL (extract, transform, and load) layer.

Managing risks to systems is essential. The fact is that risk cannot be reduced to zero for all institutions, as they have limited resources. Therefore, being appreciative of risk, especially at the level of the specific risk, allows institutions to prioritize scarce resources (Elky 2006). The project team that is selected should be highly motivated and assigned with a dedicated project manager. The project management has to be influential; this includes proper selection of vendors with clearly defined requirements by the banks. The project objective should be well laid out and communicated to the vendors, the staff involved, and the senior management. Proper planning with achievable goals includes sufficient resources during the implementation, as these bottlenecks usually happen at the user end when they are required to carry out their business as usual and are required to perform the user acceptance test at the same time. Delays in projects often stem from these problems and have to be addressed at the very beginning before the kick-off of system implementation.

Apart from that, it is essential that the banks be aware and get the right perspective on the regulations. There are specific classifications and parameters where intervention is required to localize in terms of jurisdiction or current market state. Localizing to jurisdiction is carried out at the central bank level, but constantly changing market conditions will require calculation parameters to be adapted so that the ratios can be an alert for an imminent crisis. It would make sense for the LCR to be monitored under forward-looking market scenarios. This enables the bank to make appropriate contingency plans proactively rather than trying to take corrective measures while already in a liquidity crisis, which could be prohibitively expensive (SunGard 2015).

IBIs needs to engage in more innovative Shariah-compliant HQLA structures that would fulfill all Shariah standards across the IBIs. Certain Islamic banks have even more challenges as they are unable to purchase the readily available sukuks in the current market to meet the HQLAs as required in the LCR. The Shariah standards of certain banks should also enable banks in need to meet the regulatory requirements based on maslahah, i.e., the public interest.

In order to have deposits as qualifying criteria, the banks need to develop a penalty clause in their contracts to discourage premature withdrawals. This requires certain deposit contracts or terms and conditions to be looked at again to be in line with the QTD requirements as well as the consumer and market conduct department at BNM and Shariah principles (for IBIs). This will help, in time, to educate customers or the public about placing funds without prematurely withdrawing them.

Furthermore, for the LCR to play the desired role, the right incentive structure needs to be in place. Funds transfer pricing (FTP) can provide an important policy instrument for asset liability

management and liquidity risk management, and liquidity needs to be an integral component of a bank's FTP framework. Just as interests and risks are transfer priced, liquidity needs to be transfer priced (SunGard 2015). The transfer pricing of liquidity is a relatively new topic and may be undertaken as a study for future research. It is important to establish here that liquidity has a business value that needs to be priced. Therefore, business units responsible for generating liquidity need to be incentivized accordingly.

Strategies that could be implemented to maintain or increase the LCR include a bank diversifying the deposit base while focusing on mobilizing long-term liabilities, mostly from the retail segment. This will help to address the deposit concentration and liquidity mismatch in the balance sheet, as well as consistently maintain the LCR ratio at comfortable levels. In addition to retail deposits, treasury could also focus on attracting more customers to help to diversify its deposit portfolio in order to shift from the current excessive financial institution deposits category that carries a 100% runoff rate to corporate deposits, which carries a 40% runoff rate. However, the cost factor will be increased as corporates are becoming more sophisticated in terms of pricing and will demand higher rates from the banks.

4. Discussion of Challenges of the LCR

To vitalize the marriage between Islamic banking and Basel III, a lot still needs to be done, both by regulators as they enforce the local regulation and banks as they adapt their infrastructure. Although implementing a system may be an approach to establish a speedier process, bankers must realize that the Basel rules will change, and systems have to be flexible to meet the changes. Moreover, the regulators and banks must play their roles in ensuring that the governance, liquidity planning, and modeling per leading industry practice are streamlined. Globally, banks have put a great deal of effort into understanding the fundamentals and regulatory perspectives of the LCR. These initiatives may not be revolutionary breakthroughs, yet they reflect a gradually meticulous ride. There is a critical need for banks to consistently study and enhance the impact of the new liquidity rules on profitability, as we anticipate that it would be factored into critical business practices and pricing in the future. Data management must be improved, and new policies are put in place to measure assets according to their liquidity merits and liabilities to their stability. Systems implementation for the LCR is still relatively new for all banks and vendors. There still exists a substantial distance between the existing system infrastructure of the banks and the LCR model requirements defined by BNM under Basel III.

This study paves the way for a more detailed study into controlling and pricing the liquidity risk via the funds transfer pricing mechanism. In addition, the current study focuses mainly on the implementation and challenges of the LCR within the context of a single Islamic bank in Malaysia. Further research on challenges faced by other banks in Malaysia and globally may provide a broader perspective on issues related to the implementation of the LCR. As such, the findings of this research would benefit a wider audience, including but not limited to banks, solution providers, and advisory services providers such as consultancies and regulators. While this research offers some new insights, the implications of the Basel III liquidity framework undoubtedly warrant further exploration. For future research, similar studies can be conducted to include cross-country analyses and different measures of market competition.

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