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Abstract

This paper investigates the impact of liquidity creation on the efficiency of Islamic banks. More precisely, it examines the curvilinear relationship between liquidity creation and Islamic bank efficiency in Gulf Cooperation Council (GCC) countries. To do this, a sample of 34 Islamic banks is selected over the period 2012-23. Employing a system GMM technique to address issues of endogeneity, the outcomes reveal the existence of an inverted U-shaped nexus between liquidity creation and Islamic bank efficiency, signaling the risk of excess liquidity. Additionally, CSR disclosure, audit quality, the Shariah Supervisory Board, and institutional quality moderate this relationship. This study provides several important implications for bank managers and policymakers in effectively managing excess liquidity risk and optimizing the efficiency of Islamic banks.

Keywords: Liquidity creation, Islamic bank efficiency, Corporate social responsibility, Audit quality, Shariah Supervisory Board, Institutional quality.
JEL Classifications: G1, E1.

ملخص

تبحث هذه الورقة البحثية في تأثير خلق السيولة على كفاءة البنوك الإسلامية. وبشكل أدق، تدرس العلاقة المنحنية بين خلق السيولة وكفاءة البنوك الإسلامية في دول مجلس التعاون الخليجي. ولتحقيق ذلك، تم اختيار عينة من 34 بنكًا إسلاميًا خلال الفترة 2012-2023. وباستخدام أسلوب نموذج المتغير العام (GMM) لمعالجة قضايا المنشأ الداخلي، كشفت النتائج عن وجود علاقة على شكل حرف U مقلوب بين خلق السيولة وكفاءة البنوك الإسلامية، مما يشير إلى خطر فائض السيولة. بالإضافة إلى ذلك، فإن الإفصاح عن المسؤولية الاجتماعية للشركات، وجودة التدقيق، وهيئة الرقابة الشرعية، والجودة المؤسسية، كلها عوامل تخفف من هذه العلاقة. وتقدم هذه الدراسة العديد من التداعيات المهمة لمديري البنوك وصانعي السياسات في إدارة مخاطر فائض السيولة بفعالية وتحسين كفاءة البنوك الإسلامية.

1. Introduction

Gulf Cooperation Council (GCC) countries occupy a prominent position in the global economy thanks to their wealth of natural resources—particularly their hydrocarbon reserves—and their ongoing efforts to diversify their economies (Khémiri et al., 2024). This transition process is characterized by economic growth and the rapid development of sectors unrelated to oil processing, which is a source of new opportunities and challenges. High oil revenues have opened vast opportunities for investment in infrastructure and human capital, but dependence on natural resources will continue to threaten sustainable growth if diversification is not successful. This dynamic particularly influences the banking sector, where Islamic banks have become major players in the region's financing and economic development (Ben Mim and Ali, 2020).

Islamic banks play an important role in financing initiatives that support economic diversification by offering financial products that comply with Shariah law and align with the region's cultural values. These banks facilitate economic stability by encouraging investment in other sectors apart from oil and gas, promoting resilience to the changeability in the commodity prices (Sturm et al., 2008; Alharthi et al., 2024). Particularly, Islamic banks display their uniqueness in terms of conformity with the principles of Islamic finance, especially regarding the prohibition of interest-taking and assuming risk. However, they also operate in an environment marked by specific regulatory constraints and high expectations in terms of compliance with Shariah standards. In the GCC countries, these banks have become a linchpin of the financial sector, accounting for a substantial proportion of it. One striking feature of Islamic banks is their high liquidity, which creates both opportunities and threats to their efficiency and resilience.

The creation of liquidity in Islamic banks depends on several factors, such as the use of certain financial instruments (e.g., sukuk, Murabaha, ijarah…etc.) that enable them to provide liquidity in accordance with Islamic regulations. However, some studies suggest that excessive liquidity could generate increased risks (Karatas, 2017; Ali et al., 2019; Mabrouk and Farah, 2021).

To address the excessive liquidity risk, it is important to strengthen sustainability (corporate social responsibility (CSR)), governance (Shariah Supervisory Board (SSB), audit quality), and institutional (institutional quality) factors. Such mechanisms not only enhance bank compliance with Islamic standards but also boost transparency and stakeholder confidence (Khémiri and Alsulami, 2023). In addition, the integration of CSR into Islamic banks' strategies can modulate the alignment of their activities with stakeholder expectations and the facilitation of sustainable development goals (Haniffa and Hudaib, 2007). Finally, institutional quality, which refers to the contextual characteristics of GCC countries—such as political stability, regulatory transparency, and regulatory effectiveness—may enhance the potential of the positive impact of liquidity management on bank efficiency (Khémiri and Alsulami, 2023).

In order to achieve this, this study has three principal goals. First, it aims to investigate the nexus between liquidity creation and Islamic banking efficiency in GCC countries. Next, it explores the curvilinear relationship between liquidity creation and Islamic bank efficiency. Finally, the study analyzes the moderating effect of sustainable and governance factors on this nexus.

To accomplish these goals, this research addresses the following questions. First, how does liquidity creation impact the efficiency of Islamic banks in the GCC countries? Second, what are the characteristics and extent of the curvilinear association between liquidity creation and Islamic bank efficiency? Third, how do sustainable and governance factors moderate the correlation between liquidity creation and Islamic bank efficiency?

This paper seeks to deliver key contributions to current literature. Specifically, it aims to assess the curvilinear association between liquidity creation and Islamic bank efficiency. It also delivers more evidence on the moderating effect of sustainable and governance factors on the liquidity creation-Islamic bank efficiency nexus. Even though several studies having been carried out on the influence of liquidity creation and Islamic bank efficiency in various countries, this paper is a pioneer in investigating the association between liquidity creation and Islamic bank efficiency in the GCC countries.

Employing the System Generalized Method of Moments (SGMM), this study examines the curvilinear correlation between liquidity creation and Islamic bank efficiency in a context where stakeholders are expected to interact positively with high levels of liquidity creation and vice versa. The main findings of this study indicate that liquidity creation improves the efficiency of Islamic banks and that these banks do not need to reach a certain efficiency threshold to improve their performance. This study differs from recent research that argues that increasing (or decreasing) levels of liquidity creation always led to improved banking efficiency, which could be explained by the specificity of Islamic banks.

The paper is organized into five sections. Section two summarizes the literature review regarding the liquidity creation-bank efficiency nexus. Section 3 presents empirical models and methodology. Section 4 discusses the estimated results and robust tests, while conclusions and recommendations are presented in section 5.

2. Literature review and hypotheses development

2.1. Liquidity creation and bank efficiency

The research on the nexus between liquidity creation and bank performance remains a highly significant area of inquiry within banking economics. Two seminal works in this regard are those of Allen and Gale (1998) and Diamond and Dybvig (1983), which have considerably enhanced

researchers' knowledge in this area. The implications of liquidity creation for bank performance are obtained from the literature on liquidity creation and bank stability. In this regard, the available literature focuses on two competing hypotheses: the liquidity creation-stability (LCS) hypothesis and the liquidity creation fragility (LCF) hypothesis. More specifically, the LCS hypothesis states that procedures for the proper management of bank liquidity led to a stable and sound financial system (Allen and Gale, 1998). If banks aim for the necessary level of liquidity, they will be able to cope with credit fluctuations. This, in turn, optimizes the fluidity of financial markets. Moreover, good liquidity management by banks helps avoid certain types of risk, such as financial crises and banking panics. Therefore, it attracts more investors and encourages people to put their money in banks. Good management strengthens the confidence of lenders and depositors in the continuity of the financial system and the stability of banks. In addition, the LCS hypothesis suggests that one of the main functions of banks is to create liquidity, which tends to have a positive impact on their performance. Specifically, banks create liquidity by transforming deposited short-term liabilities into long-term illiquid assets, thereby giving impetus to economic activities to develop income through interest rate spread (Berger and Bouwman, 2009). It suggests that the process improves profitability by allocating bank resources efficiently, especially in economies with limited access to credit. Efficient financial intermediation further reduces information asymmetries and transaction costs, therefore increasing a bank's competitive advantage and overall performance (Townsend, 1979; Diamond and Dybvig, 1983; Diamond, 1984). In return, they convert deposits into loans, generating a certain amount of liquidity that generally contributes to economic growth. According to Berger and Bouwman (2016), they create liquidity on and off-balance sheets; hence, they are crucial for their operational efficiency and profit making. Furthermore, strong governance structures by the banks can further optimize this concept of liquidity creation and keep it focused on the pathways of long-term strategies of value maximization (Boot and Thakor, 2000).

The LCF hypothesis, however, states that undue bank liquidity mismanagement—especially from unnecessary balance sheet expansion and lending to high-risk consumers—significantly raises vulnerability to financial crises (Diamond and Dybvig, 1983). Notably, excessive cash reserves can obscure significant risks and encourage managers to engage in activities that undermine banking stability (Rajan, 2006). In addition, lenders to underperforming banks may take higher risks because of information asymmetries and conflicts of interest (Stiglitz and Weiss, 1981; Jeitschko and Jeung, 2005). The higher the coverage ratio, the lower the market share prices and the higher the risk of bank failure (Fama, 1965). Information asymmetry between bankers and borrowers are also sources of inefficient liquidity management. Specifically, moral hazard worsens because excess liquidity encourages bankers to engage in poor lending and risk taking. Banks with excess liquidity are tempted to grant loans to risky projects to increase the volume of loans granted and thus dividends (in the form of bonuses). As a result, lenders would lower their collateral requirements due to the deterioration in loan quality. This type of risky operation leads to massive defaults that undermine banking stability.

Furthermore, when banks issue risky loans to generate liquidity, they risk repayment issues if borrowers default, causing financial distress and hindering their ability to manage financial stress. Banks may fail to meet liquidity demands during massive deposit withdrawals or market disruptions, potentially leading to banking crises and systemic shocks. As a result, moral hazard and excessive risk-taking amplify default and financial instability. Excessive liquidity creation can also unbalance the banking intermediation process by lessening the capacity of banks to act in an effective allocation between depositors and borrowers, thereby degrading their performance (Gurley, 1960). Even though liquidity exists, bad management of liquidity could bring imbalance to the banks' cash flows, making it impossible for banks to meet their short-run liabilities (Freixas and Rochet, 2008). The LCF then postulates that liquidity undermines bank stability (Acharya and Naqvi, 2012).

In practice, few studies have established a linear relationship between liquidity creation and banking efficiency. In fact, most previous studies have assessed the effect of liquidity creation on performance or stability, with mixed results (Tran et al., 2016; Veeramoothoo and Hammoudeh, 2022; Dua and Niu, 2020; El-Chaarani et al., 2023; Mahawiya et al., 2023; Niu, 2024). For instance, Veeramoothoo and Hammoudeh (2022) find that liquidity creation and stable net financing have a positive effect on the performance of banks in the US. The same result is corroborated by Dua and Niu (2020), who demonstrate that liquidity creation improves banking performance. Furthermore, El-Chaarani et al. (2023) conclude that liquidity creation improves the economic and financial performance of banks operating in the GCC region in times of crisis. Niu (2024) shows that in times of low economic uncertainty, hoarding liquidity has a negative impact on the profitability of US banks. However, in times of high political uncertainty, hoarding liquidity has a positive effect. Using a sample of banks in the MENA region, Jian et al. (2023) show that higher capital and liquidity ratios limit banks' ability to engage in sustainable lending, while financing liquidity has a positive and statistically significant effect on their growth. In a recent study, Cobbinah et al. (2024) reveal that credit risk increases the financial performance of Ghanaian banks, meaning that prudent credit management promotes profitability.

Other studies, however, suggest that the creation of excessive liquidity could deteriorate bank performance. In this context, Fungacova et al. (2021) find that high liquidity creation decreases Russian bank performance, confirming a high liquidity creation hypothesis. Yahaya et al. (2022) show that liquidity risk has a negative impact on the performance of sub-Saharan African banks. This implies that high liquidity creation can further weaken profitability. Furthermore, Luck and Schempp (2023) show that excess liquidity creation can lead to suboptimal levels of debt securities, revealing systemic inefficiency in liquidity management. Using a sample of Vietnamese banks, Vuong et al. (2024) suggest that liquidity creation reduces profitability. They attribute this conclusion to the existence of negative effects observed on the asset, liability, and equity sides, as well as in off-balance-sheet activities. The same conclusions were reported for Islamic banks. Furthermore, using a sample of banks in the MENA region, Sahyouni and Wang (2019) point to

the existence of a negative link between liquidity creation and banking performance, suggesting that greater liquidity creation increases the risk of illiquidity and, consequently, reduces profitability and increases the probability of bankruptcy. Furthermore, they also find no difference between Islamic banks and conventional banks. Indeed, their study supports the cost of failure hypothesis.

Another wave of studies has analyzed the impact of liquidity creation on the stability of conventional and Islamic banks. Some research shows that liquidity creation enhances banking stability, pointing out that higher capital ratios help absorb illiquidity risks (e.g., Garg et al., 2024; Gupta and Kashiramka, 2024). Others argue that this can undermine stability during crises (e.g., Garg et al., 2024). Tran and Nguyen (2023) observe that significant liquidity creation increases the fragility of poorly capitalized banks, requiring balanced regulation. Berger et al. (2019) note that Islamic banks create more liquidity per asset, which is significant in both high- and low-income countries. Despite this, they show greater resilience, even though this creation may reduce the profitability of both types of banks in Pakistan (Javid et al., 2024). Beck et al. (2013) find that Islamic banks have higher capitalization and better asset quality, although they are less profitable. They avoid disintermediate in times of turbulence, posting better stock market performance in the aftermath of financial crises. These differences depend on the size of the banks. Alandejani (2022) argues that sukuk issuance enhances bank efficiency via improved leverage and liquidity, although increased bank production may entail costs. Fonseka and Farooque (2024) find that conventional public banks outperform private and foreign ones, but this advantage disappears with the introduction of Islamic operations, showing an improvement in efficiency through regulation.

This field of research is constantly evolving. Recent studies have been focusing on the curvilinear relationship between various factors and banking efficiency. Hojer and Mataigne (2024) highlight a U-shaped relationship between ESG criteria and financial performance, as well as an inverted U-shaped relationship between ESG and risk for Swiss banks. López-Penabad et al. (2023) show that the relationship between CSR and efficiency is non-linear (U-shaped) in European banks with high levels of ESG. Khémiri and Alsulami (2023) demonstrate a quadratic (U-shaped) correlation between CSR and Islamic bank stability in GCC countries. Sidhu et al. (2023) note that liquidity improves the efficiency of Indian banks, but a non-linear relationship suggests that efficiency declines after reaching an optimal level of liquidity. Neves et al. (2020) show a non-linear association between bank size and performance, with contrasting effects on profitability and efficiency for Portuguese and Spanish banks. Recently, Chafai and Alsulami (2025) have shown a curvilinear association between CSR and Islamic bank efficiency.

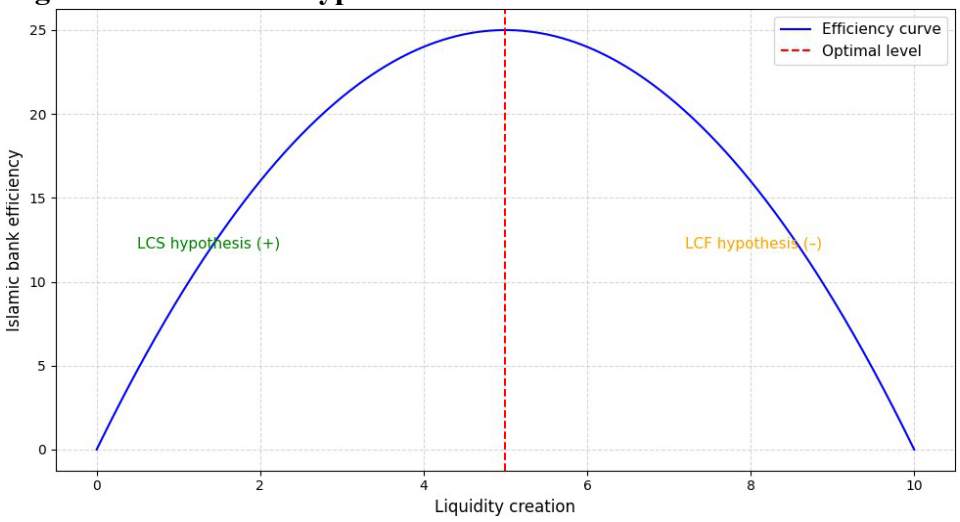
Although numerous studies have explored various determinants of Islamic bank efficiency, the potential non-linear relationship between liquidity creation and efficiency has largely been overlooked. Considering this gap, this study seeks to contribute to the literature by examining

whether a non-linear nexus exists between these variables. Accordingly, the first hypothesis of this research is formulated as follows:

- Hypothesis 1. There exists a nonlinear nexus between liquidity creation and Islamic bank efficiency.
- H1 (a). Under the LCS hypothesis, liquidity creation significantly increases Islamic bank efficiency.
- H1 (b). Under the LCF hypothesis, liquidity creation significantly reduces Islamic bank efficiency.

Figure 1 illustrates the hypothesized inverted-U relationship between liquidity creation and the efficiency of Islamic banks, grounded in the theoretical assumptions of both the LCS and LCF frameworks. On the left-hand side of the curve, low levels of liquidity creation are associated with prudent resource allocation, aligning with Shariah principles. This phase is characterized by increasing efficiency, as Islamic banks effectively mobilize resources while minimizing financial risk. At the apex of the curve, an optimal level of liquidity creation is reached, where the balance between liquidity supply and demand maximizes banking performance. At this point, risks are well-managed, and the ethical foundations of Islamic finance are leveraged to enhance resource utilization. Conversely, the right-hand side of the curve reflects excessive liquidity creation, which leads to financial fragility. This is evidenced by the misallocation of surplus funds, declining asset quality, and a rise in non-performing loans. Such negative outcomes often stem from financing low-viability projects, ultimately undermining efficiency and stability. The observed relationship thus underscores the importance of prudent liquidity management to support sustainable and stable growth in Islamic banking.

Figure 1. Theoretical hypotheses



Source: Author's calculations.

Notes: LCS is the liquidity creation-stability hypothesis and LCF is the liquidity creation-fragility hypothesis.

2.2. Moderating effects of sustainability and governance factors

2.2.1. CSR disclosure

According to Chen and Chen (2024) and Chafai and Alsulami (2025), most studies find that CSR is positively and negatively related to both liquidity creation and bank efficiency for various reasons. For example, some researchers argue that a good performing CSR bank would minimize its liquidity creation in times of financial crisis as a risk reduction strategy to protect stakeholders during unappealing economic periods. However, good CSR practices may increase liquidity creation by increasing deposits and loans, thereby improving banks' liquidity position. However, the impact of CSR on liquidity creation varies depending on bank size, capital, and the nature of financial crises (Zheng et al., 2023).

The moderating effect of CSR on the liquidity creation-bank efficiency nexus has rarely been discussed in existing banking literature. It seems that most of the previous research has generally focused on the direct effect of CSR on conventional and Islamic banks in terms of financial performance or stability and thus have produced different results. In the conventional banking industry, Belasri et al. (2020) claim that CSR improves bank efficiency but only in developed countries with strong investor protection and high stakeholder orientation. It was concluded that some institutional features are necessary for CSR to significantly enhance bank efficiency. Furthermore, George et al. (2023) conclude that CSR expenditure maximizes Indian bank performance. Forgione et al. (2020) suggest that bank efficiency in common law countries (US, UK, Canada, Australia, and Ireland) and in countries with effective stakeholder protection can be boosted by investing in CSR activities. In the same vein, Wu and Chen (2024) and Cao et al. (2024) indicate that the increasing trend in ESG investment tends to be associated with improvements in bank efficiency, particularly in environmental and governance issues.

More specifically, Cao et al. (2024) observe that ESG investments have a positive impact on bank efficiency. They note that environmental and governance aspects increase efficiency, while social factors decrease efficiency. Moreover, this association is further strengthened by Fintech, so that efficiency increases more with higher ESG investment. However, Shaddady and Alnori (2024) demonstrate that ESG practices lead to lower efficiency, which means that not all ESG initiatives ensure an immediate increase in efficiency. Shahwan et al. (2023) also prove that aggregate CSR practices have a positive effect on the technical efficiency of Egyptian banks in Islamic and conventional industries. In addition, Alam et al. (2023) demonstrate that ESG activities have a positive effect on the overall efficiency of banks, especially for conventional banks. However, the effect is negligible for Islamic banks, indicating a lack of adequate investment in ESG practices.

Other studies have progressed by testing the moderating effect of CSR on the association between some factors (CSR reporting, culture…etc.) and banking efficiency or performance and stability.

For instance, Elbardan et al. (2023) conclude that CSR committees positively moderate the relationship between CSR reporting and external assurance and firm value. Similarly, Hojer and Mataigne (2024) find that CSR investments increase the performance of European banks. In addition, Persakis and Al-Jallad (2024) confirm that CSR is effective when the environment, specifically economic conditions and social values, acts as either a reinforcing or moderating factor in its impact on bank performance. Xie and Zhang (2023) show that media attention positively moderates the nexus between CSR and the efficiency of foreign direct investment by Chinese firms. Nevertheless, Zhang et al. (2024) exhibit that CSR has a negative moderating effect on culture, religion, and the firm financing choices nexus. From an Islamic perspective, Elkilany and Kortam (2024) find that the correlation between the Islamic business approach and expertise is moderated by CSR practices. Khémiri and Alsulami (2023) show that governance practice moderates the nexus between CSR and stability of Islamic banks in GCC countries. Khémiri et al. (2024) conclude that CSR moderates the correlation between financial inclusion and bank stability; therefore, a balanced approach could achieve an optimal trade-off between stability and risk. Meanwhile, Chafai and Alsulami (2025) show that the audit quality moderates the CSR-Islamic bank efficiency.

The extant literature suggests that the moderating role of CSR on the nexus between liquidity creation and Islamic bank efficiency has not yet been examined. A thorough exploration of such a relationship would be a significant addition to the extant literature on Islamic banking. Figure 2 illustrates this conceptual model. Thus, the second hypothesis is as follows:

- Hypothesis 2. CSR disclosure moderates the relationship between liquidity creation and Islamic bank efficiency.

2.2.2. Audit quality

The governance structures of Islamic banks have been shown to have a significant impact on the relationship between liquidity creation and bank efficiency. It is evident from the findings of earlier research that corporate governance exerts a significant influence on the management of liquidity and the enhancement of bank efficiency and performance (Safiuallah et al., 2022; Wardhani et al., 2024). This effect is more pronounced in Islamic banks due to the difference in governance practices from conventional banks and their direct impact on liquidity risk management and efficiency. Islamic banks have been found to exhibit higher levels of total factor productivity in comparison with their conventional banking counterparts. This observation suggests that effective governance structures may play a pivotal role in enhancing the efficiency of Islamic banks. Furthermore, the efficacy of corporate governance within Islamic and conventional banking institutions is enhanced through mechanisms such as voice and accountability, which optimize the utilization of resources, minimize costs, and enhance liquidity creation (Sufian et al., 2017; Kamarudin et al., 2020).

Given its placement in the governance structure, audit quality would be a critical lever for better transparency, the application of standards, and strategic decision making in improving the stability and performance of banks (Khémiri and Alsulami, 2023). In this regard, Haddad et al. (2021) note that audit quality enhances the liquidity and financial performance of conventional banks, but its effect on liquidity creation in Islamic banks is still ambiguous, indicating that other factors have a dominant influence. Other recent studies (Haddad, 2022; Haddad, 2024) suggest that audit quality is a crucial determinant of bank performance and stability. Some studies indicate that audit quality is one of the determinants of bank performance and stability (Haddad, 2022; Haddad, 2024).

The moderating role of audit quality, however, is not sufficiently explored in the study on the liquidity creation-Islamic bank efficiency nexus. Only a few studies present the role of audit quality as a moderating variable in the liquidity and efficiency of Islamic banks. For instance, Darlis and Utary (2022) demonstrate that profitability negatively moderates the correlation between liquidity and Islamic bank efficiency. Moreover, Khémiri and Alsulami (2023) argue that governance structure has a moderating effect on the relationship between CSR and the stability of Islamic banks in the GCC region. Nevertheless, some research assesses the moderating role of information quality in the relationship between information asymmetry and earnings management in Jordanian industrial firms (Makhlouf et al., 2022). In addition, Zahid et al. (2022) report that audit quality (especially the Big 4) positively and negatively moderates the relationship between ESG and financial performance for firms operating in Western European countries. In the same vein, Chafai et al. (2024) provides evidence that audit quality (internal and external) moderates the relationship between financial inclusion and investment efficiency of non-financial firms operating in the MENA region. They show that the implementation of appropriate financial inclusion policies needs to combine the choice of inclusive financial services with high quality auditing. This can avoid agency costs and thus improve financial efficiency.

In sum, the role of audit quality as a moderator of the relationship between liquidity creation and Islamic banking efficiency has not yet been identified. This study will fill this gap. Therefore, the third hypothesis is as follows:

- Hypothesis 3. Audit quality moderates the relationship between liquidity creation and Islamic bank efficiency.

2.2.3. Shariah supervisory board

In the field of Islamic finance, the SSB plays a key role of ensuring compliance with the Shariah principles, which might influence the liquidity management and overall performance of these banking institutions. The SSB reinforces Islamic bank liquidity by confirming the conformity of Islamic banks with Shariah principles; in turn, this attracts more clientele to deposit their money with banks. In addition to enhancing liquidity, good governance over SSB enhances market disciplines optimally for better control over assets and liabilities to gain improvement in liquidity

(Khomsatun et al., 2021; Khémiri and Alsulami, 2023). This topic highlights a multidimensional problem associated with the specific characteristics of the Islamic governance structure—specifically, the moderating role played by the SSB in the liquidity creation-Islamic bank efficiency nexus.

In practice, previous studies have highlighted the significance of the SSB in determining the efficiency and financial performance of Islamic banks while optimizing strategic decisions (Mollah and Zaman, 2015; Mim and Mbarki, 2021; Baklouti, 2022). For instance, Mollah and Zaman (2015) illustrate that SSB enhances Islamic bank performance. Baklouti (2022) indicates that the number of meetings significantly enhances banking performance, whereas multiple directorships diminish it.

Other research has focused on the moderation of the SSB in terms of the nexus between some factors and bank performance (stability). Subsequently, Neifar et al. (2020) prove that the quality of the SSB positively moderates the nexus in regards to financial performance, operational risk disclosure, and board efficiency. The authors establish that high-quality SSBs maintain the commitment of GCC Islamic banks to disclosing such risks even in times of improved performance for enhanced transparency with stakeholders. Khomsatun et al. (2021) establish that the SSB moderates the influence of Sharia disclosure on Islamic bank soundness, especially in the management efficiency and liquidity of Islamic banks. Eldaia (2022) states that the quality of the Shariah committee has a moderating effect on the nexus between the characteristics of the audit committee and the performance of Takaful companies in Malaysia. In addition, Khémiri et al. (2023) find that the SSB moderates the non-linear nexus between CSR disclosure and Islamic bank stability, but this curvilinear link changes into an inverted-U shape. Furthermore, Salsabila and Widyastuti (2024) demonstrate that the SSB moderates the nexus between various performance indicators (such as intellectual capital) and financial performance.

The existing literature suggests that the role of the SSB as a moderating variable in the relationship between liquidity creation and Islamic bank efficiency remains underexplored. A more in-depth examination of this moderating effect would offer a valuable contribution to the field of Islamic banking. Considering this gap, the fourth hypothesis is proposed as follows:

- Hypothesis 4. The SSB moderates the relationship between liquidity creation and Islamic bank efficiency.

2.2.4. Institutional quality

Given the limited number of studies addressing this issue, the moderating role of institutional quality in the relationship between liquidity creation and banking efficiency remains ambiguous. While a few existing studies have examined institutional quality, they primarily focus on its influence in moderating either liquidity creation or other determinants of bank performance and stability rather than its integrated effect. Notably, some researchers have highlighted that

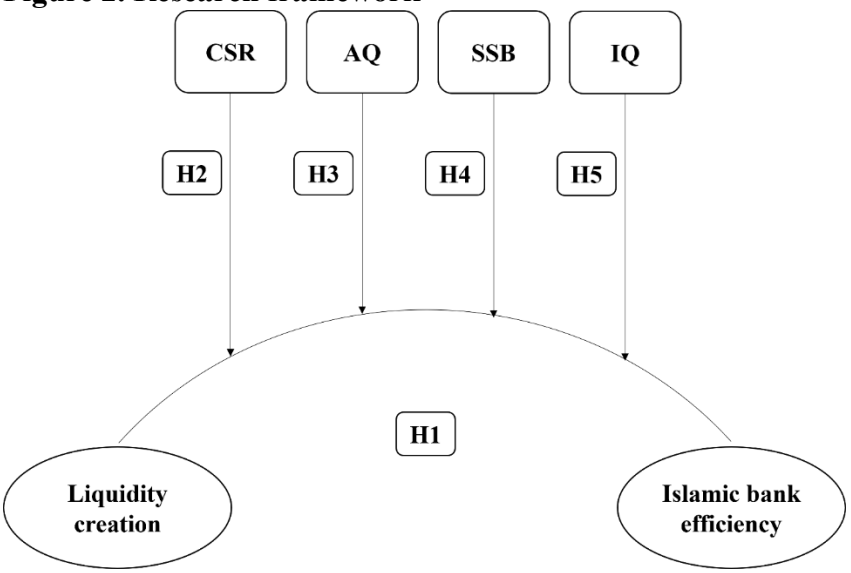
institutional quality plays a pivotal role in facilitating liquidity creation and enhancing banking efficiency within conventional banking systems. However, this dynamic remains insufficiently explored in the context of Islamic banking, warranting further investigation. For instance, Baradwaj (2016) demonstrates how strong institutional quality significantly enhances the ability of banks to create liquidity, leading to an increase in performance. This effect is dynamic and promotes liquidity creation during the affluent period and recessions, which dampens the nexus between institutional quality and bank efficiency. Javid et al. (2024) also indicate that corruption positively moderates the liquidity creation-bank stability nexus. In another line of research, Bawuah (2024) depicts that institutional quality strengthens the positive impact of bank capital on liquidity creation in sub-Saharan Africa and infers that strong institutions complement the role of bank capital by improving liquidity creation and overall bank performance.

A similar finding has also been reported in the Islamic banking sector. In this context, Khémiri and Alsulami (2023) argue that CSR-Islamic bank stability can be moderated by institutional quality. Furthermore, Akmal et al. (2024) demonstrate that corporate governance exerts differential effects on the performance of Islamic and conventional financial institutions within the Pakistani context. Their findings suggest that institutional quality plays a significant moderating role in the governance-performance relationship. Specifically, the study highlights that strong institutional frameworks enhance the effectiveness of corporate governance mechanisms, thereby improving the overall performance of financial institutions. This underscores the importance of institutional quality as a critical enabler in maximizing the benefits of governance practices. Mortaza et al. (2024) identify a non-linear relationship between institutional quality, banking efficiency, and financial stability in Malaysian Islamic banks. Their findings reveal that government efficiency and regulatory quality exert a negative influence on financial stability while positively affecting non-performing loans. Furthermore, the study suggests that a strict rule-of-law environment may enable inefficient Islamic banks to operate under conditions of high financial stability. These results highlight the nuanced and differential impacts of various institutional dimensions on financial stability, depending on the indicators employed and the efficiency levels of the banks involved.

Based on the above, the literature has not been well exploited when it comes to the level of institutional quality as a moderator variable on the liquidity creation-Islamic bank efficiency nexus. A thorough investigation in this area would contribute to knowledge in the field of Islamic banking. Accordingly, the fifth hypothesis is as follows:

- Hypothesis 5. Institutional quality moderates the relationship between liquidity creation and Islamic bank efficiency.

Figure 2. Research framework



Source: Created by author.

3. Research methodology

3.1. Sample and data

This study focuses on a group of 34 Islamic banks based in the GCC countries. To ensure consistency and relevance, investment banks, savings banks, and cooperative banks are excluded, as their business models and objectives differ significantly from those of Islamic banks. Any banks that did not have at least three consecutive years of available data are also removed. The final dataset consists of 408 observations, covering the years 2012 to 2023. To build this dataset, this paper draws on several reliable sources. Bank-level financial data was obtained from the Bankscope database, while macroeconomic indicators were sourced from the World Bank's World Development Indicators (WDI). For insights into CSR and governance practices, information from the annual reports published on each bank's official website was manually reviewed and extracted. Table 1 shows the distribution of Islamic banks.

Table 1. Distribution of banks

Countries	Number of Islamic banks	Obs.	%
Bahrain	7	84	21%
Kuwait	6	72	18%
Oman	3	36	9%
Qatar	6	72	18%
Saudi Arabia	4	48	12%
UAE	8	96	24%
Total	34	408	100%

3.2. Variables

3.2.1. Dependent variable

Following previous studies (e.g., Lee et al., 2023; Fonseka and Farooque, 2024; Chafai and Asulami, 2025), this study uses the Malmquist index of the DEA approach to compute Islamic bank efficiency (*ibe*), which is represented by total factor productivity. To calculate the *ibe*, the study adopts the intermediation approach, utilizing two inputs and two outputs. For inputs, two indicators are used: (i) deposits, measured by resident deposits plus interbank deposits, and (ii) labor force. The two indicators used for outputs are: (i) total loans (for Islamic banking operations: Mudaraba, Musharaka, Ijara…etc.) and (ii) net income measured by income minus expense. To compute the *ibe* values, the deap2.1 software was employed to compute the *ibe* values of 43 Islamic banks in GCC countries.

3.2.2. Main independent variable

Following the approach in Berger et al. (2019), the three steps to the so-called "cat fat" procedure of Berger and Bouwman (2009) are applied to measure liquidity creation. The first step is classifying all bank activities (assets, liabilities and equity, and off-balance sheet) into three categories: liquid, semi-liquid, and illiquid. Table A1 sums up all bank activities with their classification into liquidity classes. In the second step, all banking activities classified in step 1 are assigned weights: 0.5 for liquid, 0 for semi-liquid, and -0.5 for illiquid activities. Third, the measure of liquidity creation—cat fat—is computed by aggregating the activities classified in step 1 and weighted in step 2, all normalized to total gross assets. Finally, following Berger et al. (2019), loans and other consumer/retail loans are removed because they are regarded as semi-liquid assets in high-income countries. The liquidity creation of bank i at time t is calculated as follows:

$$Lc_{it} = \left(\begin{array}{l} +0.5 \times (\, illiquid\ assets + illiquid\ liabilities + illiquid\ guarantees \,) \\ -0.5 \times (\, liquid\ assets + liquid\ liabilities + equity + liquid\ guarantees \,) \end{array} \right) \Big/ gross\ total\ assets \quad (1)$$

3.2.3. Moderator variables

CSR disclosure

To measure CSR disclosure, this study adopts the methodology proposed by several prior works, including Mallin et al. (2014), Khémiri and Alsulami (2023), Khémiri et al. (2024), and Chafai and Alsulami (2025), which build upon the framework suggested by Haniffa and Hudaib (2007). Specifically, a CSR disclosure index is constructed, encompassing 10 dimensions and a total of 84 elements, including criteria derived from AAOIFI Standard No. 7. Each element is treated as a binary variable: a value of 1 is assigned if the element is disclosed in the bank's annual reports or on its website, and 0 otherwise. This approach ensures an equitable weighting of the index, thereby minimizing potential biases related to subjective scoring or scale variability, as formalized in Equation (2).

$$CSR_i = \frac{\sum_{i=1}^{n} X_i}{n} \quad (2)$$

where CSRi is the corporate social responsibility index, n is the number of items expected for bank i, and Xi is a dummy variable that takes the value of 1 if the item is disclosed and 0 if not.

Audit quality

Following Chafai and Alsulami (2025), the study employs the ratio of the total number of members to the audit committee to measure audit quality.

SSB

In line with Khémiri and Alsulami (2023), the study uses the SSB score. This score combines five indicators using a principal component analysis (PCA) approach. The PCA aggregates the variables combined with each factor into a distinct composite score, avoiding multicollinearity and reducing measurement errors. The five indicators are as follows:

- Expertise of SSB: dummy variable that takes 1 if companies have an experienced SSB member and 0 otherwise
- Reputation of SSB: dummy variable which is equal to 1 if the bank has a member of the SSB who has knowledge and expertise in Islamic business law and 0 otherwise.
- Educational qualification of SSB members: dummy variable that takes 1 if firms have an SSB member with a PhD and 0 otherwise.
- Number of SSB: dummy variable that takes 1 if the bank has one or more members of SSB and zero otherwise.
- Cross-members of SSB: dummy variable that takes 1 if firms have an SSB member with cross-members and 0 otherwise.

For this score, min–max normalization is applied for each bank on a scale of 0 to 1 to facilitate analysis.

Institutional quality

To measure institutional quality, a composite variable is used to follow Khémiri and Alsulami (2023) and Khémiri et al. (2024). To measure the county governance, Kaufmann et al. (2011) use six indicators: Voice and Accountability, Political Stability, Government Quality, Regulatory Quality, Rule of Law, and Control of Corruption. These indicators are estimated to be between -2.50 and +2.50. Higher values represent more robust institutions and better governance. To combine these indicators, the PCA is employed. In addition, to facilitate analysis, the composite variable is normalized using the min–max technique and assigned to each country on a scale of 0 to 1.

3.2.4. Control variables

This study follows prior literature (e.g., Sahyouni and Wang, 2019; Smaoui et al., 2020; Lee et al., 2024; Khémiri et al., 2024; Fonseka and Farooque, 2024; Chafai and Alsulami, 2025; Wang et al., 2025; Forgione et al., 2025) that has controlled for a set of bank- and country-level variables. The log of total assets is used to control size (Bsiz). Additionally, asset quality is controlled using the ratio of loan loss provisions to gross loans (AQy). The cost-to-income ratio is employed to control the bank cost. With regard to the macroeconomic variables, two variables have been included to take account of macroeconomic fluctuations: economic growth measured by the growth rate of Gross Domestic Product (GDP) and the inflation rate.

3.3. Empirical model

This paper explores the curvilinear relationship between LC and *ibe*, as well as the moderating effect of sustainable and governance factors. Specifically, the five aforementioned hypotheses are tested. To evaluate the first hypothesis, the baseline model tests the inverted U-shaped relationship between LC and *ibe*. To this end, the model is estimated and can be written as follows:

$$ibe_{cit} = \beta_i + \beta_1 ibe_{cit-1} + \beta_2 lc_{cit} + \beta_3 lc^2_{cit} + \sum_{n=4}^{6} \beta_n cv_{cit} + \sum_{m=7}^{8} \beta_m mv_{ct} + \varepsilon_{it} \quad (3)$$

where $I\ B\ E\ c\ i\ t$ is the *ibe* for country c, firm i at time t, $I\ B\ E\ c\ i\ t-1$ is one year lag of *ibe*, LC$c\ i\ t$ is the liquidity creation for country c, firm i at time t, LCcit is the square term of liquidity creation examining the inverted U-shaped relationship, cv$c\ i\ t$ and mv$c\ i\ t$ are the vectors of control variables, and $\varepsilon\ i\ t$ is the error term.

Various studies (e.g., Lee et al., 2023, Cobbinah et al., 2024; Chafai and Alsulami, 2025) have employed the systemic GMM technique (Blundell and Bond, 1998) to analyze bank efficiency and thereby overcome both heterogeneity and endogeneity in dynamic panels. This approach helps mitigate issues of heterogeneity in dynamic panel data and addresses potential endogeneity arising from correlations between certain independent variables and the error term. However, in this study, endogeneity may persist due to factors such as reverse causality, measurement errors, time-invariant characteristics, and the presence of endogenous variables.

To mitigate the effects of reverse causality, it is essential to recognize that the correlation between LC and *ibe* is bidirectional. LC can improve *ibe* by responding quickly to financing needs and managing their assets effectively. This enables the financing of infrastructure projects or SMEs, thereby increasing asset returns and improving *ibe*. Conversely, *ibe* can generate additional liquidity through good risk management and depositor confidence, hence strengthening their ability to mobilize stable deposits and innovate with Shariah-compliant products. This dynamic interaction suggests the adoption of an empirical methodology to address reverse causality,

including instrumental variable models and dynamic panel techniques (such as the systemic GMM) to isolate the specific effect of LC on *ibe* (Forgione et al., 2025).

To solve the endogeneity problem, the systemic GMM method was used, which employs lagged independent variables as internal instruments. These instruments correct for reverse causality by providing robust exogenous variables for estimating effects. In addition, the Durbin-Wu-Hausman test was performed to confirm the presence of endogeneity in the main explanatory variables (Durbin, 1954; Wu, 1973; Hausman, 1978; Forgione et al., 2025). As far as measurement errors are concerned, CSR disclosure data are often subject to measurement errors, as they depend on the methodologies and indices used (e.g., self-reported disclosure scores). These errors can be biased. The systemic GMM is effective in this context, as it mitigates these biases by using lagged values as instruments (Arellano and Bond, 1991). These instruments are less likely to be affected by measurement errors present in contemporary observations. In addition, the use of instruments based on first differences and levels helps to control the biases introduced by these errors (Blundell and Bond, 1998). In short, reverse causality is dealt with using internal instruments based on lagged values, and measurement errors are mitigated thanks to the properties of systemic GMM, guaranteeing robust estimates.

The baseline model is extended to test the second, third, fourth, and fifth hypotheses by incorporating the moderating roles of CSRd, AuQ, SSBs, and IQy in the relationship between LC and *ibe*. Accordingly, Equations 2-5 specify the respective models that capture these moderating effects.

$$\begin{aligned} ibe_{cit} = {} & \beta_i + \beta_1 ibe_{cit-1} + \beta_2 lc_{cit} + \beta_3 lc_{cit}^2 \\ & + \beta_4 CSRd_{cit} + \beta_5 lc_{cit} \times CSRd_{cit} + \beta_6 lc_{cit}^2 \times CSRd_{cit} \\ & + \sum_{n=7}^{9} \beta_n cv_{cit} + \sum_{m=10}^{11} \beta_m mv_{ct} + \varepsilon_{it} \end{aligned} \tag{4}$$

$$\begin{aligned} ibe_{cit} = {} & \beta_i + \beta_1 ibe_{cit-1} + \beta_2 lc_{cit} + \beta_3 lc_{cit}^2 \\ & + \beta_4 AuQ_{cit} + \beta_5 lc_{cit} \times AuQ_{cit} + \beta_6 lc_{cit}^2 \times AuQ_{cit} \\ & + \sum_{n=7}^{9} \beta_n cv_{cit} + \sum_{m=10}^{11} \beta_m mv_{ct} + \varepsilon_{it} \end{aligned} \tag{5}$$

$$\begin{aligned} ibe_{cit} = {} & \beta_i + \beta_1 ibe_{cit-1} + \beta_2 lc_{cit} + \beta_3 lc_{cit}^2 \\ & + \beta_4 SSBs_{cit} + \beta_5 lc_{cit} \times SSBs_{cit} + \beta_6 lc_{cit}^2 \times SSBs_{cit} \\ & + \sum_{n=7}^{9} \beta_n cv_{cit} + \sum_{m=10}^{11} \beta_m mv_{ct} + \varepsilon_{it} \end{aligned} \tag{6}$$

$$ibe_{cit} = \beta_i + \beta_1 ibe_{cit-1} + \beta_2 lc_{cit} + \beta_3 lc_{cit}^2 + \beta_4 IQy_{cit} + \beta_5 lc_{cit} \times IQy_{cit} + \beta_6 lc_{cit}^2 \times IQy_{cit} + \sum_{n=7}^{9} \beta_n cv_{cit} + \sum_{m=10}^{11} \beta_m mv_{ct} + \varepsilon_{it} \quad (7)$$

4. Findings and discussion

4.1. Statistical analysis

Table 2 summarizes the descriptive statistics of all the variables used in this study. The descriptive statistics show that the average efficiency (*ibe*) of Islamic banks in the sample for the period 2012-20 is 0.733. Reflecting the effective use of resources, sound management, and strong adherence to Shariah principles, the sample shows a high average efficiency of Islamic banks. In addition, the average liquidity creation (LC) is 0.398, with a minimum of -0.082 and a maximum of 0.816. Liquidity creation averages 0.398, indicating active liquidity creation, although the variation across banks highlights differences in management practices influenced by institutional and regulatory factors. In addition, CSRd disclosure, audit quality (AuQ), SSBs, and IQy average 0.109, 0.604, 0.286, and 0.442, respectively. CSRd disclosure is low at 0.109, indicating a need for improved transparency, while audit quality is moderate at 0.604, indicating that the standard of financial reporting can be improved. The low average of the effectiveness of SSBs, at 0.286, underlines the need for stronger governance, while the moderate institutional quality of 0.442 indicates that the institutional structure can be further developed to ensure greater stability and efficiency in banking.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ibe	408	0.733	0.072	0.456	0.961
LC	408	0.398	0.244	-0.082	0.816
CSRd	408	0.109	0.16	0	1
AuQ	408	0.604	0.201	0	1
SSBs	408	0.286	0.197	0	1
IQy	408	0.442	0.355	0	1
BSiz	408	3.638	0.87	1.124	5.097
Cs	408	0.703	1.195	0.109	0.953
AQy	408	0.017	0.043	0.059	0.456
INFL	408	1.577	1.68	-2.54	4.07
GDPg	408	0.023	0.029	-0.058	0.090

As shown in Table 3, the Pearson correlation matrix testifies that no multicollinearity problem exists among the variables since all the estimated coefficients are less than 0.80. Additionally, no Variance Inflating Factor (VIF) is greater than 10.

Table 3. Matrix correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) *ibe*	1.000										
(2) Liqi	0.040*	1.000									
(3) CSRd	0.028*	0.206*	1.000								
(4) AUQ	-0.062*	0.030	-0.114	1.000							
(5) SSBs	0.005*	0.220*	0.428*	0.005	1.000						
(6) IQy	0.079*	0.028	0.004	0.049	0.006	1.000					
(7) BSiz	0.015	0.054	0.296*	-0.077	-0.052	-0.229*	1.000				
(8) Cs	0.013*	-0.084	-0.082	-0.019	0.024	0.037	-0.256*	1.000			
(9) AQy	0.097*	0.048	-0.062	0.035	0.110	0.154*	-0.221*	0.036	1.000		
(10) INFL	0.059	-0.106	0.029	0.095	-0.034	0.116	-0.053	0.006	-0.023	1.000	
(11) GDPg	0.020*	-0.251*	-0.162*	0.109	-0.188*	0.022	-0.039	0.032	-0.009	0.587*	1.000

*Note: * denotes the significant at the five percent level.*

Table 4 indicates multicollinearity diagnostics by using the VIF and the tolerance test. The lower the VIF value, the lower the degree of multicollinearity. Generally, a VIF value less than 10 is appropriate (Gujarati and Porter, 2009).

Table 4. VIF correlation

Variable	VIF	1/VIF
Liqi	1.13	0.886
CSRd	1.47	0.680
AuQ	1.07	0.937
SSBs	1.40	0.717
IQy	1.09	0.917
BSiz	1.87	0.535
Cs	1.65	0.606
AQy	1.09	0.916
INFL	1.60	0.625
GDPg	1.71	0.584
Mean VIF	1.41	

4.2. Empirical results

4.2.1. Does an optimal level of liquidity creation exist?

This subsection presents the results of the curvilinear association between LC and *ibe*. Table 5 provides a summary of the key results. Models 1 and 2 demonstrate that the system GMM technique is appropriate, as confirmed by the J-Hansen test, which indicates that the instrumental variables are valid and not over-identified. Furthermore, the results of the AR (1) and AR (2) tests support the null hypothesis of no first- and second-order autocorrelation, respectively, thereby reinforcing the robustness of the model specifications.

More specifically, the coefficients on the lagged bank efficiency variable (*ibe*t-1) are positive and significant at the one percent level in both models. This positive significance highlights the dynamic and persistent nature of Islamic banking efficiency in the GCC region. In other words, the past efficiency of Islamic banks positively influences their current efficiency, reflecting a spillover effect related to the accumulation of experience, the strengthening of their reputation,

and the organizational learning effect. This persistence may also indicate structural inertia, whereby efficient banks maintain their advantage through better resources. These findings underscore the need for GCC policymakers to provide an environment conducive to further efficiency gains, such as technology innovation, diversification of Islamic financial services, and an incentive-based regulatory regime. This result is consistent with the findings of Chafai and Asulami (2025).

Regarding the variable of interest, LC has a negative impact on the *ibe*, thereby supporting the LCF hypothesis. More specifically, increasing LC by 10 percent leads to a decrease in the *ibe* by 0.16 percent. This result suggests that bankers often prefer low-risk strategies to ensure institutional stability, which negatively impacts banking efficiency. In Islamic banking, a significant negative effect of liquidity on efficiency may arise from banks retaining liquidity to manage uncertainties, hindering optimal resource allocation. The lack of efficiency gains in Islamic banks within GCC economies can also be linked to specific structural features and regulations, such as Shariah compliance and high liquidity buffers that limit high-yield investment opportunities. This finding is similar to that of Sahyouni and Wang (2019) and Javid et al. (2024).

Nevertheless, this result can be better understood in terms of the inverse correlation between LC and *ibe*. More precisely, the study examines the curvilinear relationship between LC and *ibe*. Before moving on to discuss the results, the study follows Khémiri and Alsulami (2023) and Chafai and Alsulami (2025) using the Lind and Mehlum (2010) test to confirm the existence of an inverted U-shaped relationship between LC and *ibe*. The results in Table 5 (Panel B) show that the correlation between LC and *ibe* is an inverted U-shape, proving Hypothesis 1. More precisely, the result shows the existence of an inflection point estimated at 0.316, beyond which liquidity creation begins to reduce the *ibe*. Furthermore, the level of liquidity creation for Islamic banks in GCC countries is 0.398, which exceeds the estimated optimal level of 0.316. This situation suggests that Islamic banks may be in a state of excess liquidity, which could lead to a decline in the *ibe*. In other words, beyond the optimal threshold, excess liquidity may no longer contribute positively or may even be detrimental to the *ibe*. It would therefore be appropriate for Islamic banks to reassess their liquidity creation structure to achieve a more efficient level of liquidity.

The existence of a curvilinear correlation means that the sign changes from positive (left side) to negative (right side), indicating that there are two divergent sides (Figure 2). On the left side, increased liquidity creation is shown to improve bank efficiency. In fact, the positive effect of LC on the *ibe* in GCC countries can be understood through the predictions of the LCS hypothesis. More specifically, this outcome can be explained by the fact that mobilizing more liquid resources to finance investments in productive activities and meeting depositors' needs would lead to better resource allocation and efficiency. Liquidity creation therefore contributes to diversifying Shariah-compliant financial products, which enhances the competitiveness of Islamic banks in their

markets. The positive result is in line with some previous studies, such as Veeramoothoo and Hammoudeh (2022), El-Chaarani et al. (2023), and Mahawiya et al. (2023).

Beyond this inflexion point (0.316), however, the effect is reversed on the right-hand side, reflecting the constraints imposed by excessive liquidity creation. More precisely, the negative effect of LC on the *ibe* in GCC countries can be understood through the predictions of the LCF hypothesis. If banks hold too much liquidity, this could be interpreted as a sign of excessive risk aversion or inefficient allocation of resources due to missed opportunities for better returns. In addition, this tied up excess liquidity may further indicate a reliance on low-risk but low-return financial instruments, often constrained by Shariah principles. This, in turn, reduces the overall operational efficiency of Islamic banks. This result is like that of Fungacova et al. (2021) and Vuong et al. (2024).

Turning to the discussion of the effect of control variables on *ibe*, the coefficient of the bank size variable is positive and statistically significant at one percent. This positive effect can be explained by the fact that large Islamic banks benefit from economies of scale, enabling lower costs, diversified income, and superior risk management. Their greater resources support advanced technology, efficient liquidity, and robust funding strategies. This result echoes those of Chafai and Alsulami (2025). However, it contradicts with the finding of Smaoui et al. (2020).

In addition, bank cost (Cs) has a negative effect on *ibe*. High costs arise from the complexity of Shariah-compliant financial products, imposing SSB oversight and investment in technology and training. Limited economies of scale and underdeveloped secondary markets for Islamic instruments like Sukuk further drive these costs, hindering resource deployment in Islamic banks and underscoring the need for reforms to boost competitiveness and efficiency. This finding is in line with the finding of Khémiri et al. (2024).

Similarly, the coefficients of asset quality (AQy) appear positive and significant at one percent (columns 1 and 2). The positive effect arises from the critical role of asset quality in boosting the *ibe*. High-quality assets reduce credit losses, free up resources, and lower liquidity needs, enabling greater innovation and investment. They also enhance stability, attract investors, and reduce financing costs, therefore strengthening the *ibe*. This result contrasts with the findings of Khémiri et al. (2024).

Finally, the *ibe* is also affected by macroeconomic factors. Inflation negatively impacts the *ibe*, reducing asset value in financial contracts like Murabaha and Ijara, and lowering profit margins in GCC countries. This heightens default risks, as Islamic banks cannot charge interest on overdue payments, limiting loss recovery. Smaoui et al. (2020) show that inflation can reduce bank stability.

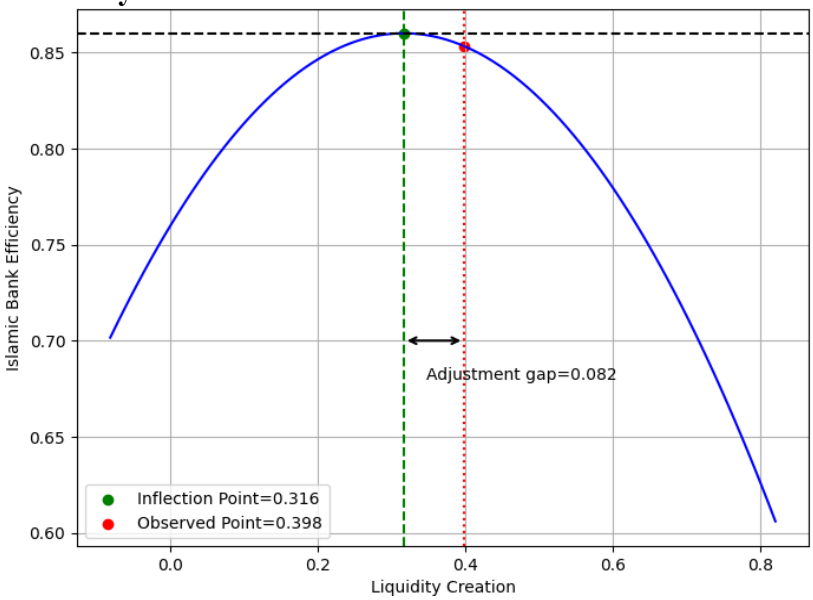
In contrast, GDP growth enhances the *ibe* by stimulating economic activity and boosting demand for Islamic financial products (column 1). It improves borrowers' creditworthiness, lowers default risks, and provides investment opportunities in productive sectors, helping banks enhance profitability while adhering to Islamic finance principles. These outcomes align with those of Chafai and Alsulami (2025).

Table 5. Main results

Variables	**(1)** ***ibe***	**(2)** ***ibe***
Panel A: Main Results		
ibe_{t-1}	0.487***	0.394***
	(0.042)	(0.054)
LC	-0.016***	0.094***
	(0.005)	(0.031)
Liqi2		-0.148***
		(0.039)
BSiz	0.112***	0.118***
	(0.007)	(0.004)
Cs	-0.017	-0.013
	(0.015)	(0.011)
AQy	0.054***	0.074***
	(0.017)	(0.016)
INFL	-0.198**	-0.091*
	(0.001)	(0.001)
GDPg	0.059*	0.021
	(0.033)	(0.034)
Constant	0.505***	0.585***
	(0.039)	(0.053)
Observations	374	374
Number of Banks	34	34
Number of Instruments	24	24
AR (1) p-value	0.000	0.000
AR (2) p-value	0.135	0.385
Hansen Test p-value	0.183	0.115
Endogeneity Test	0.000	0.000
Panel B: Test for the U-Shaped Curve		
Group	**Lower Bound**	**Upper Bound**
Interval	-0.082	0.816
Slope	0.118***	-0.148***
	(3.180)	(-4.327)
Overall Test		
t-value		3.18***
p-value		0.001
Extreme Point		0.316

*Notes: Standard errors are displayed in brackets. ***, ** and * denote statistical significance at the one percent, five percent, and 10 percent levels, respectively. T-values are shown in brackets.*

Figure 3. The inverted U-shaped nexus between liquidity creation and Islamic bank efficiency



4.3. Moderating effects

This subsection discusses the results of the moderating effects of CSRd, AuQ, SSBs, and IQy on the LC-*ibe* nexus. Table 6 summarizes the different outcomes. The results show that the direct impact of CSRd on *ibe* is positive and statistically significant (column 1). A one percent increase in CSRd results in a high increase of 30.1 percent in the *ibe*. CSR disclosure enhances *ibe* in GCC countries by aligning with ethical principles. Investing responsibly in communities, education, and the environment boosts their image, attracting value-conscious customers. This builds loyalty, lowers risks, and encourages socially responsible investments for improved *ibe*.

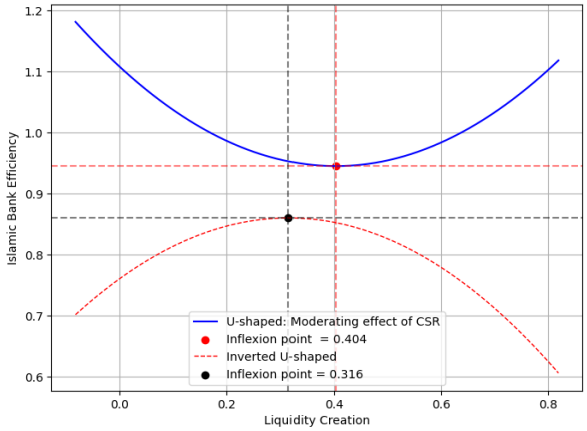
Introducing CSRd as a moderating factor transforms this relationship into a U-shaped curve, with a new inflection point estimated at 0.404 (compared to 0.316 without the moderating effect (see Figure 4). This reversal suggests that CSRd mitigates the negative effects of excessive liquidity creation by strengthening governance, transparency, and stakeholder confidence, enabling banks to better channel liquidity toward productive uses. This change in shape and inflection point indicates that CSRd plays a stabilizing and structuring role in liquidity management. With a strong social commitment, Islamic banks seem capable of transforming abundant liquidity into a lever for efficiency, particularly by financing projects with a social impact or improving their reputation in the markets. The change in the inflection point thus reflects an increase in the optimal LC threshold, suggesting that CSRd allows banks to support a higher level of liquidity without compromising their efficiency. Hypothesis 2 is therefore accepted.

As for the moderating effect of audit quality, the results also indicate that the direct impact of AuQ on *ibe* is significantly positive (column 2). A 10 percent increase in AuQ is associated with a significant rise of about 0.04 percent in the *ibe*. This result can be explained by the fact that high-quality audits foster transparency, accountability, and adherence to the financial and Shariah standards crucial in Islamic banking. This enhances internal controls, reduces information asymmetry, and increases stakeholder confidence, improving decision-making and resource allocation. Furthermore, introducing AuQ as a moderating variable transforms this relationship into a U-shaped curve, with a new inflection point at 0.318 (Figure 5). This change in shape suggests that audit quality plays a controlling and disciplining role, enabling banks to better channel liquidity, even at higher levels, toward efficient uses. Hypothesis 3 is then accepted.

Turning now to the moderating effect of SSBs, it appears that SSBs have a positive effect on the *ibe*. In other words, the two variables move in opposite directions. A 10 percent increase in SSBs leads to a 0.85 percent increase in the *ibe*. The enhanced governance and oversight functions of SSBs ensure that banking operations adhere to Shariah principles. By minimizing agency conflicts and promoting ethical practices, SSBs lead to better management and resource allocation. Respected SSBs boost stakeholder trust, attracting more customers and facilitating capital access. For Islamic banks in GCC countries, the moderating effect of SSBs shows that the general shape of the relationship changes and the inflection point shifts to a higher value of 0.340 (Figure 6). This change suggests that the presence of SSBs strengthens governance and compliance mechanisms, enabling banks to better manage higher levels of liquidity without compromising their efficiency. The shift of the inflection point to a higher threshold thus reflects an increased ability to transform liquidity into a performance lever, thanks to the ethical and strategic framework provided by the SSBs. Hypothesis 4 is therefore confirmed.

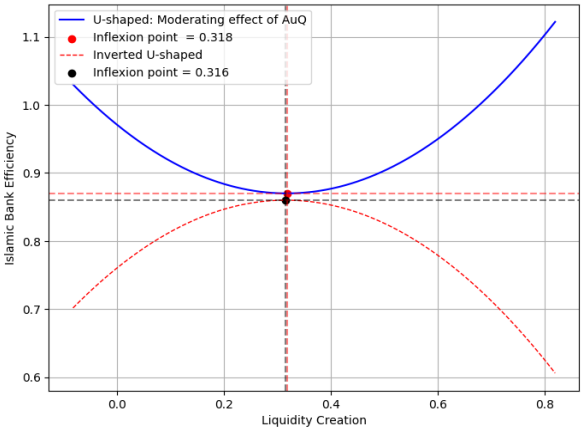
Finally, regarding the moderating effect of institutional quality, the IQy positively affects the *ibe*. More precisely, a 10 percent increase in IQy leads to a 1.1 percent increase in *ibe*. This positive effect can be explained by the presence of a stable and transparent environment. Indeed, robust legal systems, effective regulation, and low levels of corruption reduce transaction costs and improve governance. This enables Islamic banks to allocate their resources more efficiently, manage risks better, and align their operations with regulatory and Shariah principles, thereby improving their efficiency. Moreover, the moderating effect of IQy shows that the initial shape of the association has changed into a U-shape, and the inflection point shifts to a higher value of 0.377 (Figure 7). This change in form and threshold shows that a high-quality institutional environment (i.e., with good governance, rigorous regulation, and low levels of corruption) enables Islamic banks to better channel liquidity toward productive uses. IQy reduces the impact of excessive liquidity creation, transforming it into a lever for efficiency. Hypothesis 5 is therefore accepted.

Figure 4. Curvilinear nexus between LC and *ibe*, moderated by CSRd



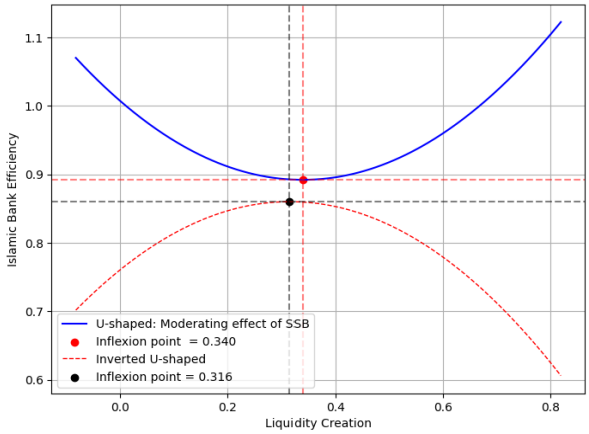
Source: Author's calculation

Figure 5. Curvilinear nexus between LC and *ibe*, moderated by AuQ



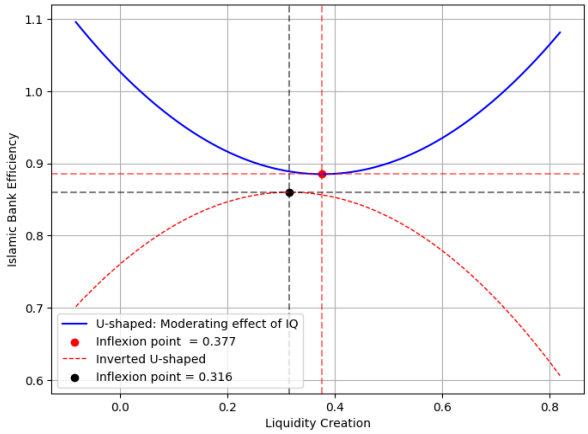
Source: Author's calculation

Figure 6. Curvilinear Nexus Between LC and *ibe*, moderated by SSBs



Source: Author's calculation.

Figure 7. Curvilinear Nexus Between LC and *ibe*, moderated by IQ



Source: Author's calculation.

Table 6. Moderating effect of sustainable and governance factors

	(1)	(2)	(3)	(4)
Variables	*ibe*	*ibe*	*ibe*	*ibe*
*ibe*t-1	0.385***	0.818***	0.684***	0.465***
	(0.041)	(0.053)	(0.068)	(0.029)
LC	0.458***	0.357***	0.276***	0.338***
	(0.078)	(0.090)	(0.069)	(0.044)
LC^2	-0.580***	-0.566***	-0.416***	-0.471***
	(0.091)	(0.127)	(0.068)	(0.066)
CSRd	0.301***			
	(0.094)			
LC x CSRd	-1.747***			
	(0.430)			
LC^2 x CSRd	2.160***			
	(0.482)			
AuQ		0.004**		
		(0.003)		
LC x AuQ		-0.506***		
		(0.137)		
LC^2 x AuQ		0.796***		
		(0.192)		
SSBs			0.085**	
			(0.077)	
LC x SSB			-0.711**	
			(0.312)	
LC^2 x SSB			1.044***	
			(0.300)	
IQy				0.110***
				(0.022)
LC x IQ				-0.775***
				(0.133)
LC^2 x IQ				1.028***
				(0.187)
BSiz	0.001	0.001	0.002**	0.005***
	(0.003)	(0.001)	(0.001)	(0.002)
Cs	0.001	0.000	-0.000	0.003***
	(0.001)	(0.000)	(0.001)	(0.001)
AQy	0.094***	0.048	-0.005	0.051***
	(0.022)	(0.038)	(0.012)	(0.017)
INFL	-0.002	-0.002*	-0.004***	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
GDPg	0.177***	0.076	0.169***	0.070*
	(0.064)	(0.073)	(0.042)	(0.041)
Constant	0.522***	0.171***	0.277***	0.463***
	(0.043)	(0.063)	(0.078)	(0.030)
Observations	374	374	374	374
Number of Banks	34	34	34	34
Number of Instruments	23	26	24	23
AR (1) p-value	0.000	0.000	0.000	0.000
AR (2) p-value	0.603	0.640	0.121	0.602
Hansen Test p-value	0.189	0.196	0.173	0.112
Extreme Point	0.404	0.318	0.340	0.377

*Notes: Standard errors are displayed in brackets. ***, ** and * denote statistical significance at the one percent, five percent and 10 percent levels, respectively. T-values are shown in brackets.*

4.4. Robustness check

4.4.1. Change in dependent variable

To safeguard the strength of the empirical results, an alternative measure of *ibe* is adopted. Following Chafai and Alsulami (2025), the cost efficiency of Islamic banks is measured using the stochastic frontier approach (sfa). The transcendental logarithm production function is written as follows:

$$Ln\left(\frac{ATC}{W_2}\right) = \alpha + \beta Ln(K) + \sum_{i=1}^{3} C_i \times Ln(Y_i) + D \times Ln(K)^2 + \sum_{i=1}^{3} Ln(Y_i)^2 + E_{12} \times Ln(Y_1)Ln(Y_2) + E_{13} \times Ln(Y_1)Ln(Y_3) + E_{23} \times Ln(Y_2)Ln(Y_3) + \sum_{i=1}^{3} F_i Ln(K)Ln(Y_i) + \varepsilon_{it} + \mu_{it} \quad (8)$$

where,

ATC	Actual total cost equal to interest expense plus operating expenses.
Inputs	
W1	Price of loanable funds measured by the interest expense to loanable funds.
W2	Operating input price measured by the operating expenses to total assets.
K	Ratio of price of loanable funds to operating input price (W1/W2)
Outputs	
Y1	Loan balances
Y2	Non-interest income
Y3	Investment and securities
ε_{it}	Random interference term, subject to $N(0,\sigma^2 \varepsilon)$
μ_{it}	Non-negative non-efficiency term subject to $N^{+}(0,\sigma^2 \varepsilon)$

Table 7 summarizes the different results of the relationship between *LC* and *ibe.* The results consistently support the five hypotheses formulated in this study, aligning closely with those derived from the primary analysis.

Table 7. Changing dependent variables

Variables	(1) sfa	(2) sfa	(3) sfa	(4) sfa	(5) sfa
sfat-1	0.645***	0.981***	0.703***	0.649***	0.510***
	(0.027)	(0.013)	(0.030)	(0.04695)	(0.032)
LC	-0.101**	0.222**	0.749***	-0.139***	-0.248**
	(0.046)	(0.086)	(0.275)	(0.042)	(0.114)
LC^2	0.185***	-0.261**	-0.567**	0.183***	0.321***
	(0.059)	(0.102)	(0.277)	(0.052)	(0.089)
CSRd		0.251***			
		(0.064)			
LC x *CSRd*		-0.135***			
		(0.031)			
LC^2 x *CSRd*		0.144***			
		(0.040)			
AuQ			0.377***		
			(0.102)		
LC x *AuQ*			-0.130***		
			(0.042)		
Lc x *AuQ*			0.103**		
			(0.043)		

Table 7. Changing dependent variables (continued)

Variables	(1) sfa	(2) sfa	(3) sfa	(4) sfa	(5) sfa
SSBs				-0.068*	
				(0.035)	
Liqi x *SSBs*				-0.687***	
				(0.209)	
$Liqi^2$ x *SSBs*				0.545***	
				(0.174)	
Liqi					-0.031
					(0.067)
Liqi x *IQy*					-0.649***
					(0.203)
$Liqi^2$ x *IQy*					0.535*
					(0.269)
Bsiz	-0.072*	-0.027	-0.079**	-0.018***	-0.072
	(0.035)	(0.024)	(0.031)	(0.007)	(0.044)
Cs	0.091	0.064	-0.057	0.012	-0.023
	(0.103)	(0.200)	(0.102)	(0.014)	(0.061)
AQy	-0.053	0.011	-0.038	0.033	-0.093**
	(0.037)	(0.016)	(0.029)	(0.064)	(0.037)
INFL	0.057**	-0.019	0.036*	0.038**	0.039***
	(0.022)	(0.039)	(0.019)	(0.017)	(0.012)
GDPg	0.047	0.066**	0.020	-0.162	-0.047
	(0.096)	(0.029)	(0.010)	(0.098)	(0.078)
Constant	0.282***	-0.012	0.020	0.465***	0.390***
	(0.025)	(0.020)	(0.071)	(0.107)	(0.030)
Observations	374	374	374	374	374
Number of Banks	34	34	34	34	34
Number of Instruments	23	26	24	23	23
AR (1) p-value	0.012	0.024	0.005	0.003	0.008
AR (2) p-value	0.131	0.152	0.283	0.116	0.423
Hansen Test p-value	0.176	0.165	0.176	0.140	0.179

*Notes: Standard errors are displayed in brackets. ***, ** and * denote statistical significance at the one percent, five percent, and 10 percent levels, respectively. T-values are shown in brackets.*

4.4.2. Change in independent variable

Following Berger et al. (2019), three other measures of liquidity creation are used:

(i) Lc_A: Asset components of liquidity creation divided by corresponding gross total assets.

(ii) Lc_L: Liability components of liquidity creation divided by gross total assets.

(iii) Lc_O: Off-balance sheet components of liquidity creation divided by gross total assets.

The inverted U-shaped nexus between LC and *ibe* is confirmed by the results, as in the previous regressions (Table 8). The moderating effects of CSRd, Audit quality (AuQ), SSBs, and institutional quality (IQy) on LC-*ibe* nexus and the other control variables are also significant. They are consistent with those observed in the previous results (Table 6).

Table 8. Changing in independent variables

Dependent Variable: *ibe*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			Lc_a					Lc_l					Lc_o		
	curvlinear	***CSRd***	***AuQ***	***SSBs***	***IQy***	**curvlinear**	***CSRd***	***AuQ***	***SSBs***	***IQy***	**curvlinear**	***CSRd***	***AuQ***	***SSBs***	***IQy***
*Ibe*t-1	0.936***	0.953***	0.857***	0.834***	0.848***	0.941***	0.859***	0.862***	0.852***	0.754***	0.926***	0.863***	0.874***	0.822***	0.446***
	(0.035)	(0.036)	(0.032)	(0.072)	(0.030)	(0.027)	(0.024)	(0.020)	(0.025)	(0.017)	(0.028)	(0.029)	(0.029)	(0.031)	(0.054)
LC	0.061***	0.122**	0.156**	0.352**	0.088***	0.191***	0.322***	-0.024***	-0.016***	-0.028***	0.022***	-0.071**	0.054***	-0.115***	-0.029***
	(0.001)	(0.046)	(0.060)	(0.137)	(0.025)	(0.047)	(0.001)	(0.002)	(0.006)	(0.002)	(0.004)	(0.030)	(0.007)	(0.024)	(0.010)
LC^2	-0.087**	-0.163***	-0.160**	-0.417***	-0.089***	-0.369***	-0.736***	0.081***	0.012***	0.036***	-0.263***	0.049***	-0.085***	0.096**	0.053**
	(0.003)	(0.045)	(0.067)	(0.143)	(0.025)	(0.085)	(0.004)	(0.013)	(0.001)	(0.004)	(0.073)	(0.017)	(0.001)	(0.038)	(0.019)
me		0.055	0.030*	0.113*	0.001		0.931*	-0.034	0.080	0.029		-0.075	-0.017	-0.036*	0.138
		(0.056)	(0.015)	(0.065)	(0.002)		(0.005)	(0.033)	(0.078)	(0.026)		(0.130)	(0.068)	(0.018)	(0.461)
LC x *me*		-0.357*	-0.165**	-0.720**	0.101***		-0.014***	-0.490***	0.726***	0.277***		0.297***	-0.097***	0.511***	0.979**
		(0.194)	(0.080)	(0.322)	(0.012)		(0.005)	(0.044)	(0.022)	(0.034)		(0.108)	(0.011)	(0.099)	(0.364)
LC^2 x *me*		0.422**	0.151*	0.879**	-0.120***		0.356***	0.223***	-0.496***	-0.250***		-0.200***	0.015***	-0.042**	-0.221**
		(0.173)	(0.086)	(0.357)	(0.007)		(0.001)	(0.022)	(0.048)	(0.061)		(0.067)	(0.002)	(0.019)	(0.103)
Bsiz	0.032	0.090	-0.080	-0.049	-0.027***	0.017*	0.143**	0.204**	0.017***	0.011*	0.275***	-0.015	0.088	0.016*	0.013
	(0.021)	(0.020)	(0.062)	(0.032)	(0.001)	(0.010)	(0.001)	(0.076)	(0.005)	(0.006)	(0.084)	(0.717)	(0.079)	(0.008)	(0.018)
Cs	0.021	-0.050	0.202*	0.301	0.056***	0.027	0.947***	0.028**	0.090***	0.083***	0.081**	0.0664**	0.032	0.014**	0.069
	(0.039)	(0.055)	(0.005)	(0.201)	(0.018)	(0.030)	(0.001)	(0.001)	(0.013)	(0.004)	(0.038)	(0.029)	(0.033)	(0.005)	(0.064)
AQy	0.039	-0.064	0.017*	0.207***	0.013***	-0.065	0.020***	0.017***	-0.011	0.013***	0.100	0.0160	0.031***	-0.019**	0.054**
	(0.081)	(0.160)	(0.010)	(0.018)	(0.004)	(0.057)	(0.004)	(0.001)	(0.030)	(0.003)	(0.452)	(0.0159)	(0.006)	(0.009)	(0.022)
INFL	-0.047***	-0.038***	-0.023***	-0.017	-0.039***	-0.525***	-0.515***	-0.034***	-0.040***	-0.039***	-0.314***	-0.151**	-0.031	-0.367***	-0.026
	(0.011)	(0.012)	(0.001)	(0.015)	(0.017)	(0.001)	(0.001)	(0.003)	(0.016)	(0.002)	(0.077)	(0.073)	(0.050)	(0.054)	(0.109)
GDPg	0.183***	0.134***	0.102***	0.081*	0.124***	0.173***	0.200***	0.124***	0.162***	0.155***	0.118***	0.086**	0.035	0.1631***	0.038
	(0.040)	(0.045)	(0.026)	(0.048)	(0.038)	(0.040)	(0.030)	(0.014)	(0.008)	(0.010)	(0.033)	(0.033)	(0.024)	(0.033)	(0.045)
Constant	0.061*	0.034	0.118***	0.125*	0.143***	0.054**	0.132***	0.131***	0.138***	0.237***	0.060**	0.135***	0.121***	0.176***	0.541***
	(0.035)	(0.040)	(0.040)	(0.069)	(0.030)	(0.026)	(0.024)	(0.021)	(0.024)	(0.017)	(0.027)	(0.027)	(0.030)	(0.028)	(0.053)
Observations	374	374	374	374	374	374	374	374	374	374	374	374	374	374	374
Number of Banks	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Number of Instruments	23	26	24	23	23	23	26	24	23	23	30	28	28	25	22
AR (1) p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR (2) p-value	0.052	0.070	0.071	0.096	0.140	0.052	0.330	0.051	0.370	0.390	0.68	0.073	0.94	0.075	0.144
Hansen Test p-value	0.160	0.196	0.239	0.145	0.157	0.240	0.180	0.132	0.193	0.143	0.146	0.177	0.165	0.189	0.173

*Notes: Standard errors are displayed in brackets. ***, ** and * denote statistical significance at the one percent, five percent, and 10 percent levels, respectively. T-values are shown in brackets. me is a moderator variable.*

5. Conclusion and recommendations

As one of the most urgent issues, excessive LC can undermine *ibe* by increasing credit risk, Shariah non-compliance, operational inefficiency, and moral hazard. This is particularly due to the misallocation of resources as well as decision-making that is not based on solid principles. This paper investigates, on the one hand, the non-linear nexus between LC and *ibe* in GCC countries and, on the other hand, the moderating effect of sustainable (CSRd) and governance (AuQ, SSB, and IQ) factors on this nexus.

The main results show a non-linear correlation between LC and *ibe*. This positive correlation becomes negative once the optimal LC level of 31.60 percent is reached. This correlation can be describ*e*d as an inverted U shape, which confirms the LCS and LCF hypotheses. This suggests that, at moderate levels, LC can gradually enhance *ibe* by meeting Shariah-compliant financing requirements, thereby improving profitability and facilitating financial intermediation. However, beyond an optimal level, excess LC generates excessive risk, thereby reducing *ibe*. The results further suggest that there are a number of factors that help maintain *ibe* after experiencing the risks of excessive LC: investing in CSR practices, improving audit quality, and strengthening Islamic and national governance. This proves that Islamic banks are called upon to devote non-invested funds to sustainability goals while relying on an ethical and responsible financial model.

This paper offers solid recommendations for Islamic bank managers and policymakers. Specifically, it recommends that Islamic banks adopt a balanced approach to liquidity management, creating sufficient liquidity to support financial intermediation and stability while avoiding excesses that could lead to inefficiencies, excessive risk-taking, or non-compliance with Shariah principles. Furthermore, regulatory authorities should establish prudential Islamic financial frameworks incorporating optimal liquidity thresholds and strengthened oversight mechanisms. Tools such as stress tests, early warning systems, and indicators of excess liquidity should be used to detect signs of potential fragility. Improved regional coordination among GCC regulators would also help to prevent systemic imbalances related to liquidity and promote sustainable financial growth that is consistent with the ethical principles of Islam. Finally, regulatory authorities are encouraged to strengthen these governance mechanisms by integrating CSR practices, improving audit quality, and strengthening the role of Islamic and national governance. These measures should stabilize the nexus between liquidity creation and efficiency, thereby ensuring the sustainability of Islamic banks.

This study has several limitations that should be noted. First, the study focuses solely on Islamic banks in GCC countries, which limits the scope of its findings to contexts with similar economic, regulatory, and institutional environments. Second, sustainable and governance factors can be difficult to measure consistently due to a lack of available data. Finally, the influence of factors such as technological innovation and ownership structure on the efficiency of Islamic banking was

not considered. Future research could involve taking the analysis to other regions or comparing Islamic banks with conventional banks. It would also be appropriate to introduce new governance factors and utilize more advanced econometric techniques. Finally, studying the impact of external shocks, such as the ESG disclosure mandate, oil price fluctuations, the post-COVID-19 crisis, and geopolitical instability would improve our understanding of the trade-off between liquidity creation and banking efficiency.

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Appendix A
Table A1. Bank liquidity creation construction

Assets	
Illiquid Assets	**Liquid Assets**
	Reserve Repos and Cash Collateral
	Trading Securities and at FV through Income
Other Mortgage Loans	Available for Sale Securities
Corporate and Commercial Loans (Mudaraba, Musharaka, Murabaha)	Held to Maturity Securities
Other Loans	At-equity Investment in Associates
Investment in Property	Other Securities
Other Earning Assets	Cash and Due from other Banks
Foreclosed Real Estate	Insurance Assets
Fixed Assets (Ijara)	
Goodwill	
Other Intangibles	
Current Tax Assets	
Deferred Tax Assets	
Discontinued Operations	
Other Assets	
Liabilities and Equity	
Liquid Liabilities	**Illiquid Liabilities and Equity**
Customer Deposits (Amanah, Mudaraba, and Musharaka)	Senior Debt Maturing after 1 Year
Deposits from Banks	Subordinated Borrowing
Repos and Cash Collateral	Other Funding
Trading Liabilities	Fair Value Portion of Debt
	Credit Impairment Reserves
	Reserves for Pensions and Other
	Current Tax Liabilities
	Deferred Tax Liabilities
	Other Deferred Liabilities
	Discontinued Operations
	Insurance Liabilities
	Other Liabilities
	Pref. Shares and Hybrid
	Capital accounted for as Equity
	Common Equity
	Non-controlling Interest
	Securities Revaluation
	Reserves
	Foreign Exchange
	Revaluation Reserves
	Fixed Assets Revaluation and other Accumulated OCI
Off-balance Sheet	
Illiquid Guarantees	**Liquid Guarantees**
Guarantees	Prohibited by Gharar
Acceptances and Documentary Credits Reported Off-Balance Sheet	
Committed Credit Lines	
Other Contingent Liabilities	