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UNDERSTANDING FINANCIAL EFFICIENCY IN ISLAMIC BANKS: A CONCEPTUAL PERSPECTIVE

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Abstract:

Financial efficiency is particularly important in Islamic banking because of its implications for competitiveness, long-term resilience, and sustainability. Despite substantial empirical research, its conceptualisation remains fragmented across different dimensions, measurement approaches, and analytical perspectives, which limits conceptual clarity and complicates the interpretation of efficiency across studies. Using a conceptual literature review, this study critically synthesises relevant prior research to clarify the meaning, dimensions, measurement approaches, and contemporary issues of financial efficiency in Islamic banking. Financial efficiency is distinguished from financial performance by focusing on how effectively banks transform resources into financial outcomes rather than on profitability outcomes alone. Financial performance reflects a bank's financial outcomes, commonly assessed through profitability. The synthesis identifies technical, cost, profit, scale, and allocative efficiency as complementary dimensions of financial efficiency. It further highlights that the interpretation of efficiency in Islamic banks should consider their Shariah-compliant operational structures, ethical principles, and social objectives alongside conventional financial considerations. The findings suggest that a more holistic understanding of financial efficiency is necessary to reflect the multidimensional and evolving nature of Islamic banking. The paper contributes to the literature by consolidating fragmented perspectives on financial efficiency and providing a clearer conceptual basis for understanding and evaluating its multidimensional nature in Islamic banking. Future research should extend this conceptualisation by examining how sustainability,

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technological transformation, and Shariah-related considerations can be incorporated into multidimensional efficiency assessment.

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Financial Efficiency; Islamic Banks; Islamic Finance; Technical Efficiency

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Introduction

In the economic system of every country, banks, being one of the important financial institutions, are working as a backbone for economic growth (Murrar, 2024) by channelling the savings from surplus economic agents to needy sectors of financing for their productive, investment, and consumption activities (Miftari, 2023). As compared to conventional banking, Islamic banking has shown better performance and emerged as one of the fastest-growing segments of the global financial industry over the past few decades (Ghenimi et al., 2024; GIFR, 2024). Now the Islamic banking industry has expanded beyond its traditional markets in the Middle East to Southeast Asia, Africa, Europe, and other regions, supported by increasing demand for Shariah-compliant financial products and stronger regulatory recognition of Islamic finance (Balarabe et al., 2023; Mainata et al., 2025). Unlike conventional banking, Islamic banks operate based on the Shariah principles that prohibit interest-based transactions and stimulate risk-sharing, asset-backed financing, ethical investment, and social responsibility (Abiola-Adams et al., 2023).

With the remarkable expansion of Islamic banking, its financial performance has become a critical point of concern for different stakeholders, including regulators, policymakers, investors, and bank managers. In this regard, practitioners and researchers have employed many measures to determine the performance of Islamic banks, for instance, return on assets (Islam et al., 2022), the Islamic performance ratio (Razali et al., 2024), return on equity (Al Sharif, 2023), profitability (Muzakki, 2024), net operating margin (Razali et al., 2024), financing (Khalidin, 2022), financial health (Nugroho, 2023), non-performing loans (Chowdhury et al., 2023), financial development (Baita et al., 2024), financing risk (Suprayitno, 2024), liquidity risk (Adi & Rifa'I, 2023), credit risk (Rizqa & Haryono, 2023), resilience (Solikhin, 2024), etc. However, financial efficiency has been recognised as the best parameter to measure the bank's financial performance by determining how effectively the

bank is managing the resources (input) to convert them into optimal financial performance (output) by providing strategic information to all relevant stakeholders (Mai et al., 2023). Thus, efficiency is an indispensable element of the long-term financial success and sustainability of the banking industry (Nasim et al., 2024), as it is fundamentally significant for any sector of the economy (Ullah et al., 2023).

As Islamic banking is based on Shariah principles and unique contractual arrangements (e.g., Murabahah, Musharakah, Ijarah, Mudarabah, etc.), the examination of financial efficiency in Islamic banks needs a broader perspective that incorporates both Islamic financial principles' compliance and economic performance (Rusydiana & Marlina, 2019; Wanke et al., 2017). Further, the dual-banking system in many regions has highlighted the significance of financial efficiency in Islamic banking, where Islamic and conventional banks compete parallelly for the same customers, deposits, and investment opportunities. Thus, efficiency is a very significant determinant of competitiveness, profitability, and long-term sustainability since Islamic banks' competitiveness gets weakened by financial inefficiency and reduces their ability to attract both depositors and investors. Because structural constraints make Islamic banks less efficient as compared to conventional banks (Risfandy et al., 2022). So, Islamic banks witness cost inefficiencies due to limited economies of scale, shorter institutional experience, higher monitoring costs in profit-and-loss sharing contracts, and lower market share compared to conventional counterparts (Lassoued et al., 2025; Sutrisno & Widarjono, 2022).

In prior empirical literature on Islamic banking efficiency, there is still mixed debate. For instance, some studies found that conventional banks outperform Islamic banks in cost efficiency and profit efficiency (Alqahtani et al., 2017; Chaffai, 2022; Johnes et al., 2014), and few studies found that Islamic banks show superior technical and scale efficiency, particularly in jurisdictions where Islamic finance has achieved greater institutional maturity. In this regard, it has been witnessed that Islamic banks show stronger capital buffers, higher liquidity levels, and relatively lower default risks due to institutional evidence compared to conventional counterparts (IFSB, 2024). Ultimately, enhanced bank financial efficiency increases the bank's stability even in times of crisis (Fakhrunnas et al., 2024) and the bank's financial performance (Jallow, 2022). Moreover, the credit risk of banks also decreases by financial efficiency (Isnurhadi et al., 2021). Thus, financial efficiency is a very significant element to measure the financial performance through ensuring the financial stability in the long run. The aforementioned contrast between Islamic banks and conventional counterparts also requires having better knowledge of Islamic financial banks' efficiency.

Further, another problem has also been observed: although financial efficiency is a different concept as compared to other conventional financial performance measures, efficiency is still being considered interchangeably with profitability, return on assets, return on equity, market value, etc. Technically, financial efficiency focuses on how effectively resources are utilised to achieve outcomes. For instance, a bank can have higher profitability while parallelly operating inefficiently if excessive inputs are required to generate those profits. In the same way, a bank may be technically efficient but may be unable to reflect profit efficiency or cost efficiency. So, due to the above distinctions, Islamic banks' efficiency can be affected differently by Shariah-compliant operational requirements as compared to conventional performance measures (Ouertani et al., 2020; Octrina & Mariam, 2021). Financial efficiency should be distinguished from financial performance, although the two are closely related. Financial performance reflects a bank's financial outcomes, commonly assessed through profitability, whereas financial efficiency evaluates how effectively resources are transformed into desired

outputs. Thus, profitability alone does not fully represent efficiency because it does not account for the resources used to achieve those outcomes. Financial efficiency therefore provides a broader assessment of resource utilisation across technical, cost, profit, scale, and allocative dimensions. Therefore, the multidimensional behavior of financial efficiency requires more understanding of financial efficiency in Islamic banks.

Prior empirical literature focused on investigating different types of financial efficiency (technical efficiency, cost efficiency, profit efficiency, allocative efficiency, and scale efficiency) by employing the different measurement techniques and theoretical assumptions (Adawiyah et al., 2023; Mai et al., 2023; Saâdaoui & Khalfi, 2024). Although such studies have given significant empirical insights, they have also added to a fragmented understanding of financial efficiency in Islamic banks. Keeping in view the above research issues, the present study focuses on giving a comprehensive conceptual understanding of financial efficiency in Islamic banks and synthesising existing knowledge, unlike empirical studies that focus on estimating efficiency scores or identifying determinants. Most importantly, this study reviews the conceptual foundations of financial efficiency, investigates major types of financial efficiency along with measurement methods, analyses contemporary debates within the literature, and proposes future directions for research. In the theoretical perspective, this study significantly contributes to the existing literature on financial efficiency in the contexts of Shariah banks by giving a stronger base for future empirical research. From a practical perspective, this study is very beneficial for bank managers, depositors, investors, policymakers, practitioners, etc. The structure of the remaining paper is segregated into the methodology, literature review, arguments and analysis, implications and future research direction, and conclusion.

Methodology

This study employed a conceptual literature review to develop a comprehensive understanding of financial efficiency in Islamic banking. Relevant empirical and conceptual studies were identified through Google Scholar, focusing on the meaning, dimensions, measurement approaches, and contemporary issues of financial efficiency. Studies directly relevant to these areas were considered, while irrelevant and repetitive studies were excluded. No fixed publication period was imposed to allow the inclusion of both foundational and contemporary research. The selected literature was critically synthesised by comparing conceptualisations and measurement approaches and identifying areas of convergence, conceptual differences, and emerging considerations.

Literature Review

This section focused on the conceptual foundational understanding of financial efficiency in Islamic banks, dimensions of financial efficiency, reviews the literature on financial efficiency in Islamic banking, and different measurement approaches.

Understanding of Financial Efficiency in Islamic Banks

Efficiency is always considered a significant central section in economics, production theory, sustainability, and long-term financial success of the banking industry (Nasim et al., 2024; Ullah et al., 2023). Initial works by Edgeworth (1881), Pareto (1909), Koopmans (1951), and

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Farrell (1957) established the foundation of efficiency analysis by emphasizing the optimal allocation and utilisation of scarce resources. Further, Farrell (1957) segregated allocative efficiency from technical efficiency with this claim that these two dimensions make overall economic efficiency. In general, efficiency measurement determines a firm's ability to optimise output and profitability while dropping costs with low inputs, as amplified output per unit of input shows enhanced efficiency (Ouertani et al., 2020). In the banking context, efficiency means measuring the financial performance of the bank, instead of focusing on only accounting profits, by investigating how effectively the resources (input) are being managed by the bank to convert into optimal financial performance (output) by providing strategic information to researchers, policymakers, and bank management (Mai et al., 2023). Thus, the investigation of the financial efficiency of Shariah banks is very imperative to examine their long-term sustainability.

Practitioners and researchers have employed many conventional measures to determine the financial performance of Islamic banks; however, financial efficiency has been recognised as the best parameter to measure the bank's financial performance (Mai et al., 2023). Although financial efficiency is a different concept as compared to other conventional financial performance measures, efficiency is still being considered interchangeably with profitability, return on assets, return on equity, market value, etc. Technically, financial efficiency focuses on how effectively resources are utilised to achieve outcomes. For instance, productivity and efficiency are often used interchangeably (Ullah et al., 2023). Technically, production is the ratio of outputs to inputs, whereas efficiency pertains to the optimal use of resources to improve production (Mohd et al., 2020). Although financial efficiency is the best measure for financial performance (Mai et al., 2023), it should not be treated as an interchangeable concept with other financial performance measures because each captures different dimensions of organisational performance.

As far as theoretical base and framework is concerned, the concept of bank's efficiency is rooted in Cobb-Douglas production, which was developed by a prominent mathematician, namely Charles W. Cobb, and an economist, namely Paul H. Douglas, in 1928 (Cobb & Douglas, 1928). This theory was primarily established in the viewpoint of the manufacturing sector, but mainly it is applied in the banking sector to measure the banks' efficiency (Abidin et al., 2024; Istaiteyeh et al., 2024) and how financial institutions consume their resources (inputs) efficiently and effectively to have optimal financial performance (output) (Ikapel et al., 2023). A standard bank efficiency function is represented as:

$$Y = AK^{\alpha}L^{\beta} \quad (1)$$

Where Y reflects the total output (i.e., total assets/loans or bank profitability), A indicates the total factor of production by incorporating the effect of management efficiency, technological advancements, and regulatory policies. Moreover, K shows the capital input (i.e., finance, infrastructure, technological investment). L indicates the labor input (i.e., human resources, an operational taskforce, their expertise). Lastly, both parameters α and β determine the elasticity of capital and lobour, respectively. This production function offers a comprehensive framework for assessing the bank's operations under specific returns to scale (constant, increasing, or decreasing). In brief, Cobb-Douglas production theory permits researchers to hold an empirical examination of a bank's efficiency by assessing its capability to convert its input (optimal

resource allocation) into its output (maximum financial performance) and to increase efficiency too (Ikapel et al., 2023).

Efficient banks are always able to generate higher yields (output resources) with the same amount of input resources through a resource-based viewpoint (Nasim et al., 2024). So, fundamentally, efficient banks are in a better position to manage costs, resist economic shocks, mend service quality, and generate value for all stakeholders. On the other hand, inefficient banks may face issues to contest effectively, which bounds their capability towards the attraction of depositors, investors, and financing opportunities (Banna et al., 2023; Bitar et al., 2020). So, efficiency is an indispensable element of the long-term financial success and sustainability of the banking industry (Nasim et al., 2024), as it is fundamentally significant for any sector of the economy (Ullah et al., 2023) and a vital factor influencing the stability, resilience, and competitiveness of Islamic banks (Fakhrunnas et al., 2024; Firmansyah, 2022).

Dimension of Financial Efficiency

Due to the multidimensional nature of financial efficiency, studies have investigated several dimensions or types of efficiency. In general, banks have segregated the efficiency's dimensions as cost efficiency, technical efficiency, allocative efficiency, scale efficiency, price efficiency, revenue efficiency, and profit efficiency. Since a bank's operating expenses represent a major component of banking activities, cost efficiency has significant importance, which measures the capability of banks to minimize production costs while maximising or maintaining outputs with scarce resources (Mohd et al., 2020). In this regard, cost-efficient banks are always capable of providing the best financial services through utilising the least possible combination of resources. Usually, cost inefficiencies can occur from inadequate management practices, poor resource allocation, and limits associated with economies of scale (Bakour, 2023; Haider et al., 2019).

Further, cost efficiency is subdivided into technical efficiency and allocative efficiency. Technical efficiency, introduced by Koopmans (1951), refers to the ability of banks to maximise outputs from a constrained level of inputs required to produce a specified level of outputs (Farrell, 1957). It is essential for assessing performance with various inputs and outcomes and is associated with management efficacy. Production theory posits that technical efficiency assesses the efficacy of input resource utilisation when generating outputs. In a banking context, technical efficiency measures how effectively banks utilise resources such as deposits, labour, capital, and operating expenses to generate financing, income, and other outputs. Allocative efficiency means optimal resource allocation, which focuses on the ability of banks to employ inputs in optimal proportions given their relative prices to maximise output (Ouertani et al., 2020). It confirms efficiency by balancing capital and labor tradeoffs, such as ATMs and internet banking. It is possible that a bank can be technically efficient but allocatively inefficient if it fails to choose the least-cost combination of resources. As per Farrell (1957), overall economic efficiency is achieved only when technical and allocative efficiency are achieved simultaneously.

Further, scale efficiency is defined as attaining maximum production through the optimal level of input, which examines the ability of banks to operate at an optimal size (Jimoh et al., 2022). Numerically, it indicates the ratio of overall technical efficiency to pure efficiency (Samad, 2021). Banks that are either too small or excessively large may experience diseconomies of

scale that reduce overall efficiency. Inefficiency happens when production strays from the optimal activity level, resulting in elevated fixed costs (Mohd et al., 2020). Thus, scale efficiency reflects the extent to which banks utilise their size to maximise productivity. Usually, larger banks take advantage of economies of scale, although excessively large institutions can encounter bureaucratic inefficiencies and coordination problems (Kullab et al., 2024; Naseri et al., 2020).

Further, price efficiency reflects that efficient banks may provide superior services at competitive pricing from the clients' perspective. In parallel, some stakeholders believe that only efficient banks may guarantee constant returns. Moreover, only efficient banks can endure and retain their market share, whereas, according to management, inefficient banks will finally be eradicated in evolving and competitive market conditions (Siyamto, 2023). Finally, profit efficiency measures the capability of banks to maximise profits by optimising output combinations to maximise returns under prevailing market conditions. Profit efficiency focuses on both revenue generation and cost management, which lack technical and cost efficiency.

So, keeping in view the above all dimensions or types of financial efficiency, it can be summarised that financial efficiency should be viewed as a multidimensional phenomenon. Each dimension shows different aspects of banking operations and provides complementary perspectives on the effectiveness of resource utilisation; thus, no single measure is capable of fully reflecting the efficiency of banking institutions.

Empirical Literature of Financial Efficiency in Islamic Banking

Empirical research on financial efficiency in the context of Islamic banking has been expanded considerably during the last two decades; however, in this section, some of the latest important studies have been synthesised from oldest to newest to give a better conceptual understanding in a systematic way. In this regard, significant literature has been observed that investigated the efficiency of Islamic banks by considering their different dimensions in almost all regions of the world, including developing and developed countries, and they found dissimilar results regarding efficiency. For example, an interesting study by Mohd et al. (2020) determined the technical, purely technical, and scale efficiency of 108 Islamic banks' data (2004-2010) selected from 26 countries from different regions, specifically the Middle East and North Africa (MENA) and Asia. They employed the non-parametric Data Envelopment Analysis (DEA) under three income level groups (high, middle, and low) and it was found that Shariah banks from high-income countries witnessed more technical efficiency than middle- and low-income economies, wherein scale efficiency contributed more to inefficiency than pure technology.

Another study by Ouertani et al. (2020) utilised the frontier-based efficiency methodology and claimed that 26 Shariah banks of 8 Islamic economies (i.e., Malaysia, Bahrain, Jordan, Kuwait, Pakistan, Qatar, UAE, KSA) could not show cost efficiency, where technical inefficiency is the major cause. Allocative inefficiency may be elucidated by an excessive allocation of capital in relation to labor, coupled with an excessive utilisation of financial resources concerning labor. Results also suggested that Islamic banks must enhance their resource utilisation by 43.7 percent to attain efficiency. A quite similar study also focused on the 4 Islamic banks of the same above Islamic countries and examined the efficiency by employing different methods (i.e., DEA, Sharia Maqashid Index) on the data period 2018-2020 and found optimal efficiency (Hibatullah et al., 2023).

Further, Ibrahim and Ismail (2020) also focused on a very important country of Southeast Asia (i.e., Malaysia) by applying the DEA under the variable returns to scale (VRS) approach to measure the technical efficiency of sixteen Shariah banks for the time of 2008–2013. They found that all Islamic banks have at least an efficiency of 98.5 percent, with this claim that domestic Shariah banks have more efficiency than foreign counterparts. By following this study, some more studies focused on the Islamic banks of the South and Southeast Asian regions to investigate the technical, purely technical, and scale efficiency by employing the bootstrap DEA and found overall high efficiency in all dimensions (Samad, 2024; 2021).

Some studies also showed that Islamic banks are not efficient or low-efficient. For instance, Irianti et al. (2021) claimed that analytical findings revealed that Indonesian Islamic commercial banks do not have efficiency by employing the DEA for the data ranging from 2016 to 2020. Similarly, Khalimah and Gunanto (2022) found that the efficiency of Indonesian Shariah banks decreased, and as a result, productivity decreased by applying the DEA and the Malmquist productivity index to analyse data collected for the period from 2016 to 2018. Nabilah and Al Arif (2022) also claimed there is no difference in the efficiency level of Indonesian Shariah banks between before and after the spin-off policy at the spin-off bank by using the DEA and difference-in-difference approach. Further, they also found that spin-off Shariah banks showed less efficiency as compared to non-spin-off Sharia banks. A few more studies also endorsed the inefficiency of Indonesian Islamic banks (Annisya & Nurbaiti, 2022; Arifah, 2023). On the other hand, Asrar et al. (2022), Firmansyah (2022), and Mukti (2024) found the optimal efficiency in Indonesian Islamic banks.

Moreover, Srairi et al. (2022) examined the technical efficiency of Shariah banks in the Gulf Cooperation Council (GCC), and Jimoh et al. (2022) investigated the pure technical and scale efficiency of Shariah banks in Africa and Asia by employing the DEA. An interesting study by Adawiyah et al. (2023) claimed that Southeast Asian Shariah banks are managing their resources ineffectively and are thus less efficient in comparison to the Middle East by employing the Stochastic Frontier Analysis (parametric test) and Mann-Whitney Difference test (non-parametric) on the data (2015-2022) of Shariah banks selected from sixty developing countries. Ahmad (2023) also employed SFA to examine the technical efficiency of Islamic banks in Pakistan and found varying levels of technical efficiency, highlighting the need for numerous improvements. On the other hand, Abdullah (2023) used the fuzzy DEA and claimed that Shariah banks in Malaysia have optimal relative efficiency, scoring .9 out of 1.

Further, some interesting studies such as Mai et al. (2023) and Nguyen et al. (2023) examined the multi-dimensional efficiency and operational efficiency of Islamic banks, respectively, in a sample of multiple countries with a focus on the COVID-19 time by using a two-stage DEA test. Both studies' analytical findings claimed that in the time of COVID, mostly Shariah banks showed resilience to shock with optimal efficiency. Similarly, Fakhrunnas et al. (2024) emphasised the close relationship between stability and efficiency in Islamic banks, indicating that efficient institutions are generally more resilient to financial shocks. Another study by Tan et al. (2024) applied the two-dimensional fuzzy Monte Carlo frontier and found different levels of efficiency in different Shariah banks chosen from 25 countries, wherein efficiency improved with respect to time over the span from 2013 to 2021.

Evidence also supports that Shariah banks have higher technical efficiency due to stronger capitalisation and prudent risk-sharing, and some claimed that conventional banks outperform Islamic banks in cost and profit efficiency due to larger economies of scale and longer

institutional experience (Alqahtani et al., 2017; Bakour, 2023; Bitar et al., 2020; Johnes et al., 2014). Moreover, Chaffai (2022) and Samad (2021) claimed that methodological choices, institutional and market characteristics, sample characteristics, and institutional settings may vary the efficiency levels. Cross-country research slso documented substantial variations in efficiency across Islamic banking systems (Adawiyah et al., 2023). Such statistical findings show that efficiency outcomes are context-specific rather than universal.

Keeping in view the above literature, it can be summarized that financial efficiency occupies a prominent position in banking research. Nevertheless, despite the extensive and advanced literature devoted to Islamic banking efficiency, the concept itself remains far from settled. Most of the studies have focused on measuring efficiency scores and comparing Islamic and conventional banks. It has been observed that comparatively less attention has been given to conceptual understanding or clarifying what financial efficiency represents in the context of Islamic banking. Therefore, the literature has become increasingly fragmented, with different studies adopting different definitions, dimensions, and measurement approaches. There, present study emphasized on giving the foundational conceptual knowledge of the efficiency in the context of Islamic banks because it is very important for all the stakeholders, including internal management, depositors, borrowers, and investors, to have knowledge about the efficiency of banks to make the best decision.

The conceptualisation of financial efficiency in Islamic banking should consider its Shariah-based operational and social characteristics. Islamic banks pursue financial objectives within Shariah requirements, while their broader objectives can extend beyond financial outcomes to social considerations (Ibrahim & Ismail, 2020; Rusydiana & Marlina, 2019). These characteristics are relevant to efficiency assessment because Shariah governance and the selection of appropriate inputs and outputs can influence how Islamic bank efficiency is measured and interpreted (Ibrahim & Ismail, 2020).

Measurement Approaches of Financial Efficiency

In prior empirical research, different methods have been established to measure the financial efficiency in banking institutions, which are generally categorised into parametric and non-parametric methods. Researchers have employed a variety of approaches to assess efficiency: Data Envelopment Analysis (DEA), Stochastic Frontier Analysis (SFA), Mann-Whitney Difference test, Malmquist productivity index, CAMELS indicators, Economic Value Added (EVA), and Maqasid Shariah index measures (Abdullah, 2023; Adawiyah et al., 2023; Hosen & Rahmawati, 2017; Obeid & Slimene, 2024; Rusydiana & Marlina, 2019).

Among these approaches, one of the most widely used non-parametric methods of Data Envelopment Analysis (DEA), developed by Charnes et al. (1978), is used for measuring efficiency as it allows the simultaneous assessment of multiple inputs and outputs without imposing a predetermined functional form on the production process. Mostly researchers have employed DEA in Islamic banking research because it accommodates the multidimensional nature of banking activities and allows efficiency comparisons across institutions (Abdullah, 2023; Asrar et al., 2022; Firmansyah, 2022). In this regard, more recent developments have also been incorporated, such as Fuzzy DEA (Abdullah, 2023), bootstrap DEA (Samad, 2024; 2021), and two-stage DEA models to enhance efficiency estimation (Tan et al., 2024).

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
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Another parametric method which is also widely recognised i.e., Stochastic Frontier Analysis (SFA), estimates efficiency while separating random statistical errors from inefficiency components. Unlike DEA, SFA requires the specification of a functional form and permits the inclusion of explanatory variables in efficiency estimation. SFA has also got increasing attention and recognition in Islamic banking studies due to its ability to account for external shocks and measurement errors (Adawiyah et al., 2023; Ahmad, 2023). Comparative analyses suggest that DEA and SFA each possess unique strengths and limitations, and the choice of method often depends on research objectives and data characteristics (Abidin et al., 2024). For instance, DEA is deterministic and assumes that deviations from the frontier are entirely attributable to inefficiency, therefore ignoring the effects of random shocks and measurement errors. While SFA addresses this issue by incorporating a stochastic component, it requires assumptions regarding functional forms and statistical distributions.

Further, another non-parametric test (i.e., Mann-Whitney Difference test) and Malmquist productivity index have also been employed by well-known researchers to measure the efficiency (Adawiyah et al., 2023; Khalimah & Gunanto, 2022). More recently, researchers have proposed alternative measures (Maqasid Shariah Index) that integrate Maqasid Shariah, sustainability dimensions, and social performance indicators into efficiency assessment. These approaches seek to align efficiency measurement with the objectives of Islamic finance and recognize that Islamic banks pursue broader goals beyond profitability (Hibatullah et al., 2023). By keeping in view the above tests, it can be stated that no single method gives a complete representation of financial efficiency. Because financial efficiency has many dimensions, so different methods incorporate different aspects of banking operations and produce dissimilar conclusions. Thus, financial efficiency should be viewed as a multidimensional concept that requires multiple perspectives and measurement techniques by giving a comprehensive understanding of Islamic banking performance.

Arguments and Analysis

It is widely accepted by researchers that financial efficiency is very significant for the long-term financial success and sustainability of the Islamic banking industry (Nasim et al., 2024) in order to compete with conventional counterparts. Thus, knowledge of banks' efficiency level is the utmost requirement to improve the financial performance of Islamic banks and their best decision-making for all stakeholders, including bank management, policymakers, researchers, depositors, etc. Therefore, the present study has focused on to give the fundamental conceptual understanding of how efficiently and effectively Islamic banks are using their resources (input) for optimal financial performance.

The prior review of literature demonstrates that financial efficiency occupies a prominent position in banking research. Nevertheless, despite the extensive and advanced literature devoted to Islamic banking efficiency, the concept itself remains far from settled. Most of the studies have focused on measuring efficiency scores, comparing Islamic and conventional banks, or examining the determinants of efficiency. It has been observed that comparatively less attention has been given to conceptual understanding or clarifying what financial efficiency represents in the context of Islamic banking. Therefore, the literature has become increasingly fragmented, with different studies adopting different definitions, dimensions, and measurement approaches. Prior literature shows that very limited studies emphasized the investigation of Islamic banks' efficiency in Islamic developing countries, and most of them considered developed countries as well as conventional banks. As it is quite possible that the Islamic banks'

efficiency may vary with respect to developed and developing countries (Saâdaoui & Khalfi, 2024).

Further, practitioners and researchers have employed different conventional measures to determine the performance of Islamic banks (e.g., Islamic performance ratio, return on equity, profitability, etc.); however, the financial efficiency is established as a best parameter to measure the bank's financial performance by determining how effectively the banks managing the resources (input) to convert into optimal financial performance (output) by providing strategic information to all relevant stakeholders (Mai et al., 2023). Thus, efficiency is an indispensable element of the long-term financial success and sustainability of the Islamic banking industry (Nasim et al., 2024), as it is fundamentally significant for any sector of the economy (Ullah et al., 2023).

In this regard, one of the most persistent issues in the literature concerns the tendency to treat financial efficiency and other measures of financial performance (profitability, return on assets, return on equity, market value, etc.) as interchangeable concepts (Ullah et al., 2023). Financial efficiency is fundamentally a different concept, as it measures how effectively resources are utilized to achieve outcomes (Mohd et al., 2020). Other measures of financial performance reflect different concepts, but they do not imply efficiency. For instance, a bank can have higher profitability due to favorable market conditions or temporary competitive advantages while parallelly operating inefficiently. In the same way, a bank may be efficient despite experiencing relatively low profitability due to macroeconomic conditions or market competition. Since an interchangeable understanding of efficiency with other measures will mislead the different stakeholders, thus it should not be treated as an interchangeable concept of other financial performance measures because each captures different dimensions of organizational performance.

Moreover, the above distinctions become even more significant in Islamic banking due to the Shariah-compliant model of operations based upon fairness, ethical investment, risk sharing, and asset-backed financing, unlike conventional banks. So, Islamic banks' efficiency can be affected differently by Shariah-compliant operational requirements as compared to conventional performance measures (Octrina & Mariam, 2021; Ouertani et al., 2020). For instance, Shariah-based contracts (e.g., Mudarabah, Musharakah, etc.) often need more monitoring and information gathering, which can enhance operating costs and influence efficiency outcomes. Parallelly, compliance with Shariah governance requirements imposes additional responsibilities that are not present in conventional banking. So, these factors suggest that the concept of financial efficiency in the context of Islamic banking extends beyond the traditional objective of cost minimization. As a result, assessing Shariah banks exclusively by conventional efficiency frameworks may be unable to incorporate significant aspects that are fundamental to Islamic finance.

The multidimensional nature of financial efficiency also needs immediate attention. In this regard, studies have examined different dimensions in isolation (i.e., technical efficiency, cost efficiency, profit efficiency, scale efficiency, and allocative efficiency), wherein each captures different aspects of banking operations, leading to fragmented interpretations of efficiency. For instance, a bank may show technical efficiency by maximizing outputs from a given level of inputs but still have low-cost inefficiency due to unfavorable resource prices. Likewise, a bank may have strong profitability while operating below its optimal scale. Therefore, financial

efficiency cannot be adequately represented by a single measure or ratio. Instead, it should be regarded as a multidimensional construct containing several interconnected dimensions.

In addition, the growing complexity of the Islamic banking environment also needs importance, as it is a debate in existing literature of inconsistent findings amongst Islamic and conventional banks that Islamic banks are more financially efficient than conventional counterparts. These conflicting findings have often been interpreted as evidence of the superiority of one banking model over the other. However, such interpretations may overlook the contextual factors underlying these differences. In this regard, it is argued that efficiency differences are highly sensitive to market maturity, methodological choices, Shariah-related considerations, geographical and governance structures, sample characteristics, sample periods, regulatory frameworks, and bank-specific characteristics (Chaffai, 2022). Consequently, the existing contradictory findings may not be considered as weaknesses of prior empirical literature; rather, financial efficiency depends upon all above-mentioned factors, including context and operating environments (Alam et al., 2022; Aslam & Haron, 2020; Hussain et al., 2020; Kamarudin et al., 2022).

Further, it is pertinent to mention here that in prior literature researchers used diversified methodologies which gave different efficiency estimates, making direct comparisons difficult and contributing to inconsistencies in the literature (e.g., DEA, SFA, Maqasid Shariah index, Mann-Whitney Difference test, etc). The most dominant methods employed to measure efficiency are considered DEA and SFA. As mentioned in the literature review section, both methods provide significant insights but also have limitations. Further, presently no consensus exists regarding the optimal selection of inputs and outputs for measuring Islamic bank efficiency, suggesting that methodological issues remain an important challenge in efficiency research. All limitations of conventional methods of efficiency measurement become more highlighted in the context of broader objectives of Islamic finance. For instance, economic outputs and cost minimisation are the base of conventional efficiency models. Nevertheless, Islamic finance focuses on objectives that include ethical conduct, social responsibility, and the promotion of justice by extending beyond financial returns. Therefore, measuring efficiency solely through conventional financial indicators may provide only a partial understanding of Islamic banking performance. As some latest research has drawn the attention of researchers regarding the considerations of emerging relevant factors in shaping banking outcomes, i.e., sustainability, governance quality, financial stability, and environmental, social, and governance (Alam et al., 2022; Hussain et al., 2020). So, future studies of financial efficiency should move beyond narrow operational perspectives and recognise the broader objectives associated with Islamic finance.

Most importantly, the rapidly evolving banking landscape presents new challenges and opportunities for understanding efficiency. Now the traditional banking environment has been changed due to the emergence of artificial intelligence, digital banking, financial technology, and changing customer expectations. In this regard, Shariah banks will have to balance operational efficiency with innovation, cybersecurity, regulatory compliance, and sustainability commitments. So, financial efficiency should be considered as dynamic and broader construct that evolves alongside technological progress and institutional change rather than as a static concept.

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By summarising all the above observations, it is suggested that financial efficiency should not be considered a traditional particular estimation technique as a narrow interpretation of financial performance. Rather, by recognising the distinctive nature of Islamic banks, it should be recognised as a holistic and multidimensional construct showing the ability of institutions to utilise resources effectively while simultaneously maintaining financial sustainability, operational effectiveness, Shariah compliance, and broader socio-economic objectives. In the absence of such acknowledgement of these characteristics, assessments of efficiency will remain technically rigorous but conceptually incomplete. So, future discussions should move beyond the traditional debate concerning whether Islamic banks are more efficient than conventional banks. The importance of such comparisons is still significant, but they only provide limited insights into the broader meaning of efficiency in Islamic finance. Nevertheless, more attention should be devoted to understanding how financial efficiency will be conceptualised and measured in a manner that reflects the unique objectives and operating environment of Shariah banks. Thus, a more integrated perspective would provide stronger theoretical foundations for future empirical investigations and contribute to a deeper understanding of the sustainability, resilience, and competitiveness of Islamic banking institutions in an increasingly complex financial landscape. This study contributes to the literature by consolidating fragmented perspectives on financial efficiency and clarifying the complementary roles of its dimensions, providing a stronger conceptual basis for evaluating financial efficiency in Islamic banks.

Implications and Analysis

The present study has theoretical significance and practical implications. In a theoretical perspective, this study adds to the existing literature on Islamic banking by giving a broader understanding of conceptual foundations of financial efficiency, with this emphasizing that financial efficiency may not be regarded exclusively through the lens of conventional measures of financial performance (e.g., profitability, risk, etc.). This is a fact that prior research has given very insightful findings, but most of the studies have focused on measuring efficiency scores and comparing Shariah banks with their conventional counterparts. It has been observed that comparatively less attention has been given to conceptual understanding or clarifying what financial efficiency represents in the context of Islamic banking. Thus, this study has facilitated the different researchers in the context of Islamic banks' efficiency to understand the concept of financial efficiency in detailed and systematic ways, as this conceptual study discusses the definition, concepts, dimensions, literature, methodologies, and very insightful discussion along with future research directions relevant to Islamic banking's efficiency.

Further, this study also provides the inherited view of multidimensional efficiency (i.e., cost efficiency, technical efficiency, allocative efficiency, profit efficiency, and scale efficiency), which suggests that these dimensions should be regarded as complementary instead of competing dimensions. This conceptual interpretation gives a broader understanding of banking financial efficiency and clarifies the prior inconsistent findings. Most importantly, this conceptual study also proposes a new rational framework in the context of broader objectives of Islamic finance, as the conventional methods of efficiency measurement may not fully capture the unique characteristics of Islamic banks, whose operations are based on Shariah principles, ethical conduct, social responsibilities, and the promotion of justice. Thus, researchers can take benefit from these theoretical developments for future research by integrating optimal selection of inputs and outputs in efficiency measurement methods, which

can capture the economic objectives of efficiency with the broader goals of Islamic finance (Alam et al., 2022; Ibrahim & Ismail, 2020; Rusydiana & Marlina, 2019).

As far as the practical significance and implications are concerned, this study's findings are very important for the different stakeholders, including bank managers, regulators, supervisory authorities, and policymakers. As it is important for them to know that efficiency should not be evaluated solely in terms of profitability and cost minimisation, because underlying operational weaknesses and the broader objectives of Islamic finance may be ignored. Bank managers may materialise the benefit by considering the effective resource utilisation, operational resilience, and long-term sustainability. Further, regulators and supervisory authorities can also make optimal decisions by focusing on the importance of governance mechanisms, regulatory environments, and institutional quality in supporting efficient banking operations, as these factors have a significant impact on the efficiency and stability of Shariah banks (Aslam & Haron, 2020; Hussain et al., 2020; Kamarudin et al., 2022).

This study also has some significant suggestions for potential future research avenues. Firstly, researchers should focus on developing more integrated, standardised, and hybrid frameworks for examining the financial efficiency that provides a more comprehensive representation of Islamic banking efficiency. As prior empirical literature extensively employed the DEA and SFA approaches, still their methodological assumptions' dissimilarities as well as different input-output specifications often lead to inconsistent findings. In this regard, more methodological refinement is needed, since there is no consensus regarding the most appropriate input and output variables (Akdeniz et al., 2024; Iddouch et al., 2023; Mimma Kebahyang et al., 2024).

Secondly, it is suggested that future research should focus on broader dimensions (e.g., Maqasid Shariah, sustainability, environmental, social, and governance) of efficiency measurement by extending traditional financial indicators. In this way, more comprehensive understanding of Islamic banking performance will be provided by ensuring greater alignment between efficiency measurement and the objectives of Islamic finance (Alam et al., 2022; Ibrahim & Ismail, 2020). Thirdly, the swift growth of artificial intelligence, financial technology, digital banking, and big data analytics shows novel avenues to researchers for further Islamic banking research. In this regard, technological innovation can transform banking operations, improve resource allocation, and enhance competitiveness. It is proposed that researchers should explore more regarding the impact of digital transformation on Islamic banking efficiency by giving significant insights into the Islamic financial institutions' sustainability (Banna et al., 2023).

Fourthly, it is recommended for future research that researchers may focus on cross-country and longitudinal studies since studies claim that financial efficiency varies with respect to country and time because of variations in regulatory frameworks, governance structures, institutional quality, and market maturity. Research studies considering multiple regions and institutional structures can give deeper insights into the factors shaping efficiency performance by adding a significant contribution towards the development of more robust theoretical explanations (Adawiyah et al., 2023; Alqahtani et al., 2017; Chaffai, 2022; Samad, 2021). Finally, it is recommended that advanced analytical techniques (e.g., meta-frontier analysis, network DEA, fuzzy DEA, machine learning, etc.) may be employed for future efficiency research that remains relatively underutilised in Islamic banking research by capturing the complexity of banking operations and providing richer insights into the efficiency of Islamic

financial institutions (Abidin et al., 2024; Mai et al., 2023; Saâdaoui & Khalfi, 2024; Tan et al., 2024). Future research should also extend the multidimensional understanding of financial efficiency by considering sustainability, technological transformation, and Shariah-related dimensions. These emerging areas may complement established technical, cost, profit, scale, and allocative efficiency measures and provide a broader assessment of financial efficiency in Islamic banking.

This study has also faced some limitations along with insightful contributions, which can be potential areas for future research as well in the context of Islamic banking efficiency. Firstly, this conceptual research only focuses on the understanding of foundations and measurement of financial efficiency rather than empirical efficiency measurement or checking the impact of specific determinants (bank-specific characteristics, macroeconomic conditions, and country governance factors). Summarising all, it is recommended that researchers now move forward from the debate of efficiency comparison between Shariah and conventional banks, and a more comprehensive study is required for the deeper knowledge and understanding of Shariah banks' financial efficiency conceptualisation and evaluation to make them more stable, sustainable, and competitive within the distinctive environment of Islamic finance.

Conclusion

It has been established by researchers and practitioners that financial efficiency has an important significance specifically in Islamic banking because of its implications for competitiveness, long-term resilience, and sustainability. Although the prior growing empirical literature has significant insights, the conceptualisation of financial efficiency remains fragmented by adopting different exclusive dimensions, approaches, and perspectives. Therefore, the present study provides a conceptual foundation of financial efficiency in Islamic banking and emphasises that financial efficiency should not be viewed as synonymous with other conventional measures of financial performance. Rather, financial efficiency should be regarded as a multidimensional concept by integrating the different dimensions (cost, technical, allocative, profit, revenue, and scale efficiency).

By reviewing the empirical literature regarding financial efficiency in Islamic banking, this study also finds and emphasises that the Islamic banks have unique characteristics, so in this regard, broader understanding of efficiency is needed that considers Shariah principles, ethical conduct, social responsibilities, and justice. Although prior methodologies (DEA, SFA, etc.) have contributed significantly to the body of literature, in spite if this, there is no single method that is capable of fully capturing the complex operations in Islamic banking. Therefore, there is a need for a comprehensive and integrated study to provide a deeper understanding of financial efficiency in Islamic banks.

Present research also recommends some important future research opportunities along with limitations by giving a conceptual foundation for Islamic banking's financial efficiency by explaining the meaning, dimensions, and measurement of financial efficiency within the context of Islamic banks. So, now, researchers should move forward from the debate of efficiency comparison between Shariah and conventional banks, and a more comprehensive study is required for the deeper knowledge and understanding of Shariah banks' financial efficiency conceptualisation and evaluation to make them more stable, sustainable, and competitive within the distinctive environment of Islamic finance.

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