Comparative Efficiency Analysis of Islamic vs Conventional Banking System of Pakistan

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A B S T R A C T

This study investigates the efficiency of the Islamic banks in relation to Conventional banks of Pakistan. To provide insightful and comprehensive efficiency analysis of Pakistan's banking system, the secondary data from 2018 to 2023 of key performance indicators (total assets, total equity and customer deposits) of six banks (3 Islamic banks and 3 Conventional banks) have been randomly selected from the financial market of Pakistan. In this study we used Data Envelopment Analysis (DEA) to assess the technical efficiency of Islamic and conventional banks in Pakistan. By avoiding rigid assumptions about the production function, DEA offers a flexible framework for comparing bank performance. We consider three scenarios with varying combinations of inputs and outputs (total assets, total equity, and customer deposits) to capture the multifaceted nature of banking operations. Our findings show the significant variations in efficiency across different scenarios. Notably, UBL (conventional) and Dubai Islamic Bank Pakistan emerge as top performers in terms of overall efficiency. The results of our study highlight specific areas where banks can improve their operational efficiency and resource utilization.

Keywords: Islamic banking system, Conventional banking system, Efficiency, Data development analysis, Pakistan.

INTRODUCTION

The efficiency of the banking system has been a topic of interest for both academia and decision-makers for a considerable time (Miah & Din., 2017). Country's economic growth and development heavily influenced by banking sector. Banks encourage private savings, promote commerce and industry by directing funds from surplus to deficit units. Due to continuous financial advancements, better human capital and management skills, strict regulatory and compliance policies, a competitive environment, cultural changes and increased geographical complexity the banking sector has done important changes in past decades (Haris et al, 2024). The Islamic banking sector was the largest component of global Islamic financial assets at the end of 2018 (IFSB, 2018). Global Islamic banking assets have grown steadily, rising from $1.3 trillion in 2012 to $1.76 trillion in 2018. Forecasts predict this growth trajectory to continue, with projections reaching $2.175 trillion by 2024 (ICD-REFINITIV, 2020). This expansion can be attributed to

several factors, including the global financial crisis of 2007-2009, rising economic uncertainty and increasing globalization. Currently global Islamic Financial Services Industry (IFSI) assets have showed 4% year-on-year (YoY) by reaching USD3.38 trillion, Islamic banking sector was the dominant segment of global financial market by comprising 70.21% of total IFSI assets. Regionally, the Gulf was at top by holding over 52.50% of global Islamic finance assets. East Asia and the Pacific followed with 21.80%, followed by the Middle East and North Africa (excluding the Gulf) at 12.70%. Central Asia and Europe held 8.30%, South Asia 3.10%, Sub-Saharan Africa 0.70%, and other regions 0.90% (IFSB, 2024).

In 2022, both the World Bank and the International Monetary Fund (IMF) downgraded their forecasts for global economic growth. Earlier estimates at the beginning of the year predicted growth exceeding 4%. However, these figures were revised downward to 3.2% and 3.6% by the World Bank and IMF, respectively. This shift in outlook reflected growing economic uncertainty.

The Russia-Ukraine conflict further added strain, prompting the World Bank to lower its forecast again to 2.9% in early June. Economic anxieties had already risen sharply in March, as measured by the Global Economic Policy Uncertainty Index, which remained elevated compared to 2021. (BOC research institute, 2022).

Several factors have fueled the growth of Islamic banking, including the wealth generated by oil in the Gulf region and a rising demand for financial products that adhere to Islamic principles. This demand has driven a 4.3% expansion of the industry, particularly in Iran, Saudi Arabia, the UAE, and Malaysia. In some countries, Islamic banks have captured over 20% of the market share, solidifying their position as significant players alongside conventional banks (Bitar et al., 2020). Despite growing interest in Islamic banking sector of Pakistan, comprehensive research on comparative efficiency relative to conventional banks remains limited and unclear and how efficiently it operates and how its sources of inefficiency differ from conventional banking. Existing studies often employ Data Envelopment Analysis (DEA) under the assumption that both Islamic and conventional banks operate under the same production function. This approach is problematic. Since Islamic banking relies on unique organizational structures, financial instruments, and operational processes compared to conventional banking, using a common technology assumption can lead to misleading results.

LITERATURE REVIEW

When we consider efficiency of banking sector then technical efficiency refers to the ability of a bank to optimize the use of its technical resources to achieve the best output (Tan & Anchor, 2017). There has been much less investigation into Islamic banking, especially on the empirical side. Islamic banking research, particularly empirical studies, has been less explored compared to research on developed economies banking sectors, especially the U.S. and Europe (Shah et al., 2012). A study was conducted in Malaysia to check the Islamic banks efficiency. They used the DEA model to assess technical and scale efficiency. The findings of the study indicated that full-fledged Islamic banks are inefficient because of scale inefficiency rather than pure technical inefficiency (Batchelor & Wadud, 2004). Another study showed that the performance of the Islamic Bank and 8 commercial banks (CBs) in Bangladesh using ratio analysis for the

period 2007-2019. Their finding shows the Islamic banking as the fastest growing market but highlighted the different challenges it faced. (Moin & Chen, 2008).

The efficiency of Islamic banking has been the subject of analysis in numerous overseas studies. A common approach has been to utilize Data Envelopment Analysis (DEA) to assess bank performance across various countries. These studies often indicate that Islamic banks may achieve lower efficiency scores compared to conventional banks (Pantas, 2021). Despite their core differences in financial principles, Islamic and conventional banks share some common ground. Both operate as financial intermediaries, facilitating transactions between depositors and borrowers. They also utilize similar technologies for tasks like account management, money transfers, and adhering to general financing regulations (Nugroho, 2024).

Existing research explores how Islamic and conventional banks compare in terms of leverage and profitability (Srairi 2010; Toumi, Viviani, & Belkacem 2011; Mohanty et al. 2016), liquidity and asset quality (Ashraf, Rizwan & L'Huillier 2016; Beck, Demirgüç-Kunt & Merrouche 2013; Bitar, Pukthuanthong & Walker 2019), technological efficiency and cost (Alandejani & Asutay 2015; Miah & Uddin 2017; Chaffai & Hassan 2019), and the impact of non-performing loans on Islamic and Conventional banks efficiency of Islamic (Saleh, Moradi-Motlagh, & Zeitun 2020).

Although studies have offered valuable insights into the comparative performance of Islamic and conventional banks, further investigation was necessary, especially considering the impact of significant events like the COVID-19 pandemic on key financial indicators of banking sector like total assets, total equity, and customer deposits. This study aims to contribute to the existing literature by analyzing data through DEA from the period 2018-2023, enabling a comparison of bank performance before and after the pandemic.

METHODOLOGY

The population of the study was all conventional banks and all Islamic banks of Pakistan. Since there are a large number of Islamic and conventional banks in Pakistan and a comprehensive analysis of each institution is impractical, so, simple random sampling (SRS) was chosen because it ensures that each bank has an equal probability of being selected and has minimized biases. To increase sample representation, three commercial

and three islamic banks were selected randomly from list of all commercial and islamic banks is pakistan respectively through Simple Random sampling technique (Table 1).

Table. 1 Characterization of sample Islamic and conventional banks.

Sr.	Islamic Banks	Year of establishment	Year of Islamic banking	Conventional Banks	Year of establishment	Year of Islamic banking
01	Bank Islami (BI)	2006	2006	Allied Bank Limited (ABL)	1974	2018
02	Meezan Bank Limited	1997	2003	United Bank Limited (UBL)	1959	2006
03	Dubai Islamic Bank Pakistan Limited (DIBPL)	2005	2006	Habib Bank Limited (HBL)	1947	2008

The data of the following variables were collected for the period from 2018 to 2023:

- Total Assets (Ahmed, 2020).
- Total Equity.
- Customer Deposits (Ahmed, 2020).

To compare the efficiency of the selected banks, three models were developed based on the following relationships between total assets (TA), total equity (TE), and current deposits (CD):

Scenario 1

$TA = TE + CD$

This indicate the bank's asset formation is outcome of equity and deposits.

Scenario 2

$TE = TA + CD$

Similarly, equity formation is products of assets formation and value of deposits in Scenario 2.

Scenario 3

$CD = TA + TE$

The scenario 3 indicate the current deposits of banks is the outcome of its assets and equity.

DEA (Data Envelopment Analysis):

Charnes et al. (1978) pioneered Data Envelopment Analysis (DEA) as a method to assess the relative efficiency of organizations when multiple inputs and outputs are involved. This technique is particularly useful when direct comparisons are difficult due to these complexities (Ahmed, 2020). Unlike absolute measures, DEA assigns a relative efficiency score to each bank. This score reflects how a bank performs compared to the most efficient institutions within the group being analyzed. Banks on the DEA frontier are considered efficient, while those falling below it are deemed less efficient. We have used all above variable ae used both as input and output in 3 different scenarios.

RESULTS AND DISCUSSİON
Bank's Efficiency Score
Scenario 1

The results of DEA shows that UBL, HBL and Meezan Bank have a score of 1, signifying they are technically efficient in converting inputs into outputs. ABL, BI and Dubai Islamic Bank have scores below 1 (0.959, 0.904, and 0.903 respectively). This suggests that they have room for improvement in their resource utilization. The average technical efficiency across all the firms was 0.961. This indicates that on average, firms are operating at 96.1% of their potential efficiency in terms of converting inputs to outputs (Table 2). The results of this scenario shows that the Islamic banks are less efficient as compared to Conventional banks and our result shows some contradictions with another study which showed that the Islamic banks in Indonesia have an overall efficiency increase in Islamic business sectors from 2013 to 2015, as indicated by the DEA analysis. (Syairozi et al.,2017).

Scenario 2

ABL and UBL achieved a perfect score (1.000), signifying that they are technically efficient in converting inputs into outputs relative to the other firms in this analysis. HBL (0.846), BI (0.739), and Meezan (0.541) have scores lower than 1, suggesting that they have room for improvement in their resource utilization. DIBPL has a score of 0.909, indicating some inefficiency but performing better than HBL, BI Meezan. The mean TE score across all institutions is 0.839. This suggests that on average, institutions are operating at 83.9% of their potential efficiency in terms of converting inputs to

outputs. These results are also showing contradiction with the another study conducted by (Hanifah 2019) who investigated the robust performance and high efficiency levels of Islamic banking during the global crisis. But our results are ailing with another study conducted by (Ferari & Sudarsono, 2017). They investigated by using DEA that the efficiency level of Islamic banks varies and changes over time. It is also shown that the conventional banks are more efficient than Islamic banks. Conventional banks are also more efficient than Islamic banks (Table 2).

Scenario 3
BI and Meezan achieved a perfect score (1.000), signifying that they are the most efficient in converting inputs into outputs within this analysis. ABL (0.846), UBL (0.810), HBL (0.820), and DIBPL (0.912) have scores below 1, indicating room for improvement in resource utilization. The mean TE score across all institutions is 0.898. This suggests that on average, institutions are operating at 89.8% of their potential efficiency in terms of converting inputs to outputs (Table 2).

Table 2. Comparison of technical efficiency scores of Islamic and conventional banks.

Banks	Scenario 1	Scenario 2	Scenario 3
ABL	0.959	1.000	0.846
UBL	1.000	1.000	0.810
HBL	1.000	0.846	0.820
BI	0.904	0.739	1.000
Meezan	1.000	0.541	1.000
DIBPL	0.903	0.909	0.912
Average Efficiency	96.1%	83.9%	89.8%

Summary of Output Slacks
Scenario 1
All institutions (1-6) have a value of 0.000 for output slack. This indicates that no firm has any unused potential for output under the current analysis. In simpler terms, all firms are fully utilizing their resources to produce the observed level of output (Table 3).
Scenario 2
All institutions (1-6) again have a value of 0.000 for output slack. This confirms that no firm is underutilizing its output potential based on the DEA model (Table 3).
Scenario 3
All institutions (1-6) again have a value of 0.000 for output slack. This confirms that no institution is underutilizing its output potential based on the DEA model (Table 3).

Table 3. Comaprison of output slacks.

Banks	Scenario 1	Scenario 2	Scenario 3
ABL	0.000	0.000	0.000
UBL	0.000	0.000	0.000
HBL	0.000	0.000	0.000
BI	0.000	0.000	0.000
Meezan	0.000	0.000	0.000
DIBPL	0.000	0.000	0.000

Summary of Input Slacks
Scenario 1
Similar to output slacks, all institutions have a value of 0.000 for input slacks (both input 1 and input 2). This suggests that based on the DEA model, none of the firms could potentially reduce their inputs while maintaining the same level of output (Table 4).
Scenario 2
ABL, UBL, HBL and DIBPL all have zero slacks for both inputs (1 and 2). This suggests they are efficiently utilizing their inputs to achieve the observed level of output. However, BI and Meezan have positive slack values for input 2 (21193.489 and 54766.485 respectively). This indicates that according to the DEA model, these institutions could potentially reduce their input 2 by these amounts without affecting their output (Table 4).

Scenario 3

BI and Meezan, which achieved perfect efficiency scores, both have zero slacks for both inputs (1 and 2). This aligns with their perfect efficiency, indicating they are using all their inputs to achieve their output. ABL, UBL, HBL, and DIBPL have positive slack values for input 2 (ranging from 17732.278 to 29513.480). This suggests that according to the DEA model, these institutions could potentially reduce their input 2 by these amounts without affecting their output (Table 4).

Table 4. Comparison of input slacks.

Banks	Scenario 1		Scenario 2		Scenario 3	
ABL	0.000	0.000	0.000	0.000	0.000	23701.624
UBL	0.000	0.000	0.000	0.000	0.000	29513.480
HBL	0.000	0.000	0.000	0.000	0.000	17732.278
BI	0.000	0.000	0.000	21193.489	0.000	0.000
Meezan	0.000	0.000	0.000	54766.485	0.000	0.000
DIBPL	0.000	0.000	0.000	12010.857	0.000	2865.307

Summary of Peer Weights

Scenario 1

ABL, BI and Dubai Islamic Bank 1, 4, are less efficient than some others (score below 1) and have assigned peer weights. For example, ABL has a weight of 0.623 for UBL and 0.044 for firm 3. This suggests that UBL's practices have a significantly stronger influence on ABL's efficiency score compared to HBL. Similarly, BI's efficiency score is likely more influenced by Meezan (weight not shown but assumed to be higher based on 0.128 for another peer) and DIBPL's score is more influenced by HBL (weight 0.075) and possibly Meezan (Table 5).

Scenario 2

ABL and UBL (being fully efficient) have a weight of 1 for themselves, essentially using their own practices as the benchmark. HBL has weights for both ABL (0.500) and another efficient institution (likely UBL with a weight of 0.962 based on its efficiency score). This suggests that both peers influence HBL's efficiency score. BI and Meezan have a weight for ABL are 0.118 and 0.376 respectively (Table 5).

Scenario 3

This section provides weights assigned to each peer when calculating the efficiency score of a less efficient institution. BI 4 and Meezan (being fully efficient) have a weight of 1 for themselves, essentially using their own practices as the benchmark. ABL, UBL and HBL all have a high weight for BI (ranging from 5.294 to 11.494) as their peer, reflecting the strong influence of BI's efficient practices on their scores. DIBPL has a weight of 0.980 for BI, indicating BI's practices still heavily influence its score, but to a slightly lesser extent compared to ABL, UBL, and HBL (Table 5).

Table 5. Comparison of peer weights.

Banks	Scenario 1	Scenario 2	Scenario 3
ABL	0.000	0.000	0.000
UBL	0.000	0.000	0.000
HBL	0.000	0.000	0.000
BI	0.000	0.000	0.000
Meezan	0.000	0.000	0.000
DIBPL	0.000	0.000	0.000

These results confirm that BI and Meezan are the most efficient in converting inputs into outputs. The other institutions have some room for improvement, particularly in their use of input 2. The DEA model suggests they could potentially reduce this input while maintaining their current output level. Our study results are little bit different from this study which's findings had suggested that the Islamic banks have displayed higher cost efficiency and allocative efficiency values, indicating that Islamic banking is providing services at a lower cost while also considering customers' preferences (Ahmed, 2020). In our results all three scenarios are showing fluctuating trends which are just like the finding of (Pantas, 2021).

CONCLUSİON

The results of our study indicate a variation in the performance of Islamic banks and conventional banks across all the three scenarios. The results of the study find that the performance of Islamic banks varies across different scenarios. Based on the average performance across all scenarios, UBL from CBs and Dubai Islamic bank Pakistan limited are emerged as the best performing institution by average efficiency scores of 0.936 and 0.908 respectively. This study highlights the need to access the efficiency of the bank, considering the interaction of different factors and their impact on balance of different activities. It is recommended to banks that are struggling to achieve optimal performance in certain circumstances should be encouraged to implement measures aimed at improving their efficiency. These efforts may focus on allocating resources, strengthening risk management, or investing in technology to streamline operations.

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